101st Congress
2d Session
} COMMITEE PRINT {
S. Prt. 101-95

FEDERAL LIABILITIES UNDER HAZARDOUS WASTE LAWS

PREPARED FOR THE

COMMITTEE ON GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

BY THE

CONGRESSIONAL BUDGET OFFICE

MAY 1990

Printed for the use of the Committee on Governmental Affairs

29-688
U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1990

S402-4.

COMMITTEE ON GOVERNMENTAL AFFAIRS

JOHN GLENN, Ohio, *Chairman*

SAM NUNN, Georgia
CARL LEVIN, Michigan
JIM SASSER, Tennessee
DAVID PRYOR, Arkansas
JEFF BINGAMAN, New Mexico
HERBERT KOHL, Wisconsin
JOSEPH I. LIEBERMAN, Connecticut

WILLIAM V. ROTH, Jr., Delaware
TED STEVENS, Alaska
WILLIAM S. COHEN, Maine
WARREN B. RUDMAN, New Hampshire
JOHN HEINZ, Pennsylvania
PETE WILSON, California

Leonard Weiss, *Staff Director*
Harry G. Broadman, *Chief Economist*
Robert Alvarez, *Professional Staff Member*
Franklin G. Polk, *Minority Staff Director and Chief Counsel*
Michal Sue Prosser, *Chief Clerk*

CONTENTS

Page
I. Federal Liabilities Under Hazardous Waste Laws 1
II. Supplement to Federal Liabilities Under Hazardous Waste Laws 77

PREFACE

The Congress has passed several major environmental statutes regulating how hazardous wastes are to be managed and disposed and how contamination is to be cleaned up. These legislative requirements were primarily directed at the hazardous wastes generated by industrial and commercial operations. Recently, however, hazardous waste problems at federal facilities have received increasing attention. As a result, federal agencies are beginning to address their own hazardous waste responsibilities under federal and state statutes.

This Congressional Budget Office study, prepared at the request of the Senate Governmental Affairs Committee, examines the growing financial liabilities that federal agencies face under hazardous waste requirements. While any projections of the federal costs involved are uncertain at this time, the costs of hazardous waste compliance and cleanup activities at federal facilities could exceed $150 billion over the next three decades. In keeping with CBO's mandate, this study makes no recommendations.

Mollie Quasebarth of CBO's Natural Resources and Commerce Division wrote this study, under the direction of W. David Montgomery, Roger Dower, and Roger Hitchner. Douglas Kendall gathered much of the information provided in the *Federal Agencies Summaries*, a supplement to this study. Bonita Dombey and Elizabeth Chambers, both formerly in CBO's National Security Division, prepared much of the information on the Department of Defense's hazardous waste activities. Harriet Komisar, of CBO's Human Resources and Community Development Division, and Ben Wolters, of CBO's Budget Analysis Division, provided valuable suggestions on earlier drafts. Numerous federal and state officials also responded to the many requests for information. Helpful comments from many individuals outside CBO, namely, Carl Bannerman, Mark Holt, Peter Johnson, and Edward J. Yang, are also appreciated. Sheila Harty edited the study and supplement. Gwen Coleman typed the numerous drafts, and Kathryn Quattrone prepared the paper for publication.

Robert D. Reischauer
Director

April 1990

CONTENTS

SUMMARY AND INTRODUCTION ix

I TYPE AND EXTENT OF HAZARDOUS WASTES AT FEDERAL FACILITIES 1

Types of Federal Activities With Hazardous Waste Requirements *2*
Extent of Federal Responsibilities for Hazardous Wastes *6*
Additional Federal Liabilities for Hazardous Wastes *15*

II POTENTIAL FEDERAL LIABILITIES AND BUDGETARY IMPLICATIONS 21

Status of Hazardous Waste Investigations by Federal Agencies *22*
Status of Cleanup Efforts at Federal Facilities *30*
Appropriations and Projected Costs for Federal Hazardous Waste Activities *36*
Conclusion *49*

TABLES

S-1. Number of Federal Facilities With Potential Hazardous Waste Requirements, by Agency xix

S-2. Number and Status of Facilities Listed on the Federal Agency Hazardous Waste Compliance Docket, by Agency xxii

S-3. Budget Appropriations for Hazardous Waste Cleanup and Compliance for Fiscal Years 1989 and 1990, by Agency xxv

1. Number of Federal Facilities With Potential Hazardous Waste Requirements, by Type of Facility 3

2. Number of Facilities Listed on the Federal Docket, by Agency 7

3. Number of Facilities Reported Under the Categories of the Federal Docket, by Agency 9

4. Number of Federal Facilities Listed on the Federal Docket, by Location 10

5. Number of Federal Facilities on or Proposed for the National Priorities List, by Agency 13

6. Number of Federal Facilities With Potential Contamination Not Listed on the Federal Docket, by Agency 16

7. Number of Privately Owned Sites on the National Priorities List Where Federal Agencies Are a Potentially Responsible Party, by Agency 19

8. Status of Agency Investigations at Facilities Listed on the Federal Docket 25

9. Status of Agency Investigations at Facilities Not Listed on the Federal Docket 29

10. Status of Agency Cleanup Efforts at Facilities Listed on the Federal Docket 31

11. Status of Agency Cleanup Efforts at Facilities Not Listed on the Federal Docket 33

12. Budget Appropriations for Hazardous Waste Cleanup and Compliance for Fiscal Years 1989 and 1990, by Agency 40

13. Partial or Full Funding Requirements for Hazardous Waste Activities for Fiscal Years 1991 through 1995, by Agency 43

14. Projected Costs of Environmental Activities for the Department of Defense and the Department of Energy 47

FIGURE

1. Stages of Investigation and Cleanup Required by Federal Facilities Listed on the Docket 23

BOXES

1. Types and Sources of Hazardous Wastes xi

2. Major Federal Environmental Laws xiv

3. Cleanup Progress at the Rocky Mountain Arsenal 35

4. Budget Data on Agency Compliance With Federal Environmental Laws 37

5. The Underground Storage Tank Program 39

6. Uncertainties in Cost Estimates 48

SUMMARY AND INTRODUCTION

Hazardous wastes resulting from the activities of federal agencies are extensive, but their consequent costs of cleanup are as yet undetermined. Legal requirements for the proper management, disposal, and cleanup of hazardous wastes were originally conceived to regulate commercial and industrial activities, although not to the exclusion of federal activities. Recently, extensive hazardous waste problems have become apparent at federal facilities. Consequently, federal agencies are incurring large costs to improve current practices as well as to clean up contamination from past activities.

A broad range of federal activities generates, treats, and disposes of hazardous wastes. In addition, thousands of currently and formerly owned federal sites may be contaminated with hazardous wastes, as well as privately owned sites where federal agencies may have contributed. For the most part, federal agencies are only now learning the extent of their hazardous waste problems and their consequent costs under federal and state statutes.

Since 1976, the Congress has passed and amended two major environmental laws that establish federal programs to regulate how hazardous wastes are handled and to clean up sites where hazardous wastes were improperly disposed. States were given a large role in administering these programs and have often gone beyond the federal requirements. By becoming more aggressive in enforcing hazardous waste laws at federal facilities, states increase federal costs to greater but yet unknown levels.

These laws and their regulatory programs pose a substantial impact on the federal budget. Pressure will mount for funds to fulfill these responsibilities. Overlapping and changing regulations at the federal and state level make compliance and cleanup costs difficult to project. The federal costs of complying with federal and state hazardous waste laws could exceed $150 billion. Realistic estimates will require reliable information on:

- Types of hazardous wastes and their risks;
- Number of federal facilities and sites that require cleanup;
- Severity of the problems at each site; and
- Costs of cleanup at each site.

HAZARDOUS WASTES AND THEIR RISKS

Hazardous wastes are generally considered as solid and liquid wastes with the potential to affect human health or the environment adversely. In the Resource Conservation and Recovery Act of 1976, the Congress defined hazardous wastes as:

> Solid, liquid, or gaseous wastes, or combinations thereof, that may "cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness," or that may "pose a substantial present or potential threat to human health or the environment" when improperly handled.

The United States generates roughly 250 million metric tons of regulated hazardous wastes each year (see Box 1). The amount of hazardous wastes generated at federal facilities is uncertain. The Environmental Protection Agency (EPA) is currently awaiting response from federal agencies to a survey for information on this issue, which should be available in mid-1990. In the meantime, EPA estimates that the federal government owns about 1 percent of all facilities that generate hazardous wastes and about 8 percent of all facilities that transport, store, or dispose of hazardous wastes.

In the past, hazardous wastes were usually discharged directly into streams and rivers, dumped in the ocean, or disposed in landfills or surface impoundments, such as shallow unlined ditches, ponds, and waste pits. To comply with current laws, most hazardous wastes now are disposed in licensed facilities or destroyed by various treatment processes. These processes include burning in high temperature incinerators, neutralizing to less toxic levels (such as adding an acid to an alkaline waste), changing into a solid form that is easier to handle

BOX 1
TYPES AND SOURCES OF HAZARDOUS WASTES

Hazardous wastes are what remains of commercial, industrial, and household chemical products after use. These wastes contain harmful substances that are carcinogenic, corrosive, ignitable, toxic, and reactive. When disposed in the air, water, or soil, hazardous wastes may pose significant risks and endanger human health and the environment.

The Environmental Protection Agency (EPA) regulates about 500 chemicals and substances that are subject to federal requirements for hazardous waste management or cleanup. The list includes toxic chemicals, such as trichlorethylene, benzene, dioxin, and polychlorinated biphenyls (PCBs); heavy metals, such as cadmium and lead; industrial by-products, such as fuels, oils, solvents, paints, and sludges; as well as pesticides, explosives, and asbestos.

The Congress and EPA specifically exclude certain categories of hazardous wastes from federal regulation: domestic sewage, agricultural wastes, some recycled industrial liquids, and household wastes (cleaning fluids, fuel oils, pesticides, and paints). EPA also excludes certain categories of high-volume, low-hazard wastes, such as ash and sludge from fossil fuel plants, cement kiln dust, gas and oil drilling fluids, and uranium and other mining wastes.

The federal government generates many of the same types of hazardous wastes at its maintenance and repair facilities, research laboratories, and military bases as do commercial and industrial operations. Some federal activities, however, produce hazardous wastes not generally found elsewhere. These federal activities include the production of munitions, nerve gases, and other chemical weaponry through the Department of Defense and the manufacture and testing of nuclear weapons through the Department of Energy. Some components in these highly radioactive and extremely toxic wastes remain lethal for hundreds, even thousands, of years. For some radioactive contamination, no cleanup technology yet exists. Cleanup efforts at some radioactive waste sites are expected to take decades and to cost extraordinary sums.

and less likely to migrate to the surrounding area, and separating components either to obtain end products that can be disposed separately or recycled. As a result of a law enacted in 1984, waste treatment and incineration are replacing land disposal for many types of hazardous wastes.

Hazardous wastes pose a risk because of their potential to endanger human health and to damage or destroy natural resources. The potential health risks range from topical effects, such as skin burns and rashes, to more chronic illnesses, such as cancer, brain damage, nerve and digestive disorders, and reproductive problems. These effects can occur either through direct contact with hazardous substances or, as is more likely, through indirect exposure to contaminated air or drinking water. Contamination also threatens vegetation, wildlife, and valuable natural environments, such as national parks and wetlands.

Because of improper disposal, hazardous wastes contained in landfills or shallow surface impoundments can pass through the soil and contaminate the groundwater, a major source of the nation's drinking water supply. Hazardous wastes placed in metal drums or storage tanks can corrode the containers, causing leakage into the surrounding soil and nearby surface water or groundwater. Vapors rising from uncovered waste sites can pollute the air, threatening those downwind or nearby the site. Rain and surface waters can also carry uncovered hazardous wastes off-site, contaminating the soil and groundwater of neighboring properties.

The discovery in 1978 of large amounts of wastes buried in the residential community of Love Canal in New York brought the severity of these environmental and health threats to the public's attention. The level of public and Congressional concern increased as similar sites were found across the country. Although the federal government owns a relatively small proportion of all hazardous waste sites, these federal sites contain some of the nation's most serious hazardous waste contamination.

Major Environmental Legislation on Hazardous Wastes

The major statutes that established federal programs to manage hazardous wastes and to enforce cleanup requirements at hazardous waste sites are the Resource Conservation and Recovery Act (RCRA) of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. RCRA regulates the generation, transportation, treatment, storage, and disposal of hazardous wastes. CERCLA, commonly known as Superfund, created a federal program that finances the cleanup of the nation's most contaminated waste sites. Each of these statutes had subsequent amendments--the Hazardous and Solid Waste Amendments in 1984, and the Superfund Amendments and Reauthorization Act (SARA) in 1986--which significantly strengthened and broadened the provisions of the statutes. Several other federal statutes address specific concerns posed by various types of hazardous substances (see Box 2).

The types of hazardous wastes regulated under the different federal statutes are not always consistent. For example, the Clean Water Act regulates more waste products than does RCRA. RCRA covers no radioactive waste management, but CERCLA covers hazardous waste sites contaminated with radioactive substances. Some state laws regulate hazardous wastes not covered by RCRA. For this Congressional Budget Office (CBO) study, hazardous wastes generally include what EPA specifically regulates under RCRA and CERCLA and what states regulate under their own hazardous waste programs.

Federal agencies, as well as private hazardous waste operators, face a confusing set of regulations under federal and state hazardous waste laws. These laws vary in the treatment and cleanup standards required. Some of the regulations that EPA is required to establish for treatment and cleanup under RCRA and CERCLA have yet to be issued. In addition, amendments to these laws generally result in stricter waste treatment standards and broader enforcement authority for EPA and state environmental agencies. In particular, SARA broadened the federal government's responsibilities at certain types of hazardous waste sites. The government's liabilities under some of these provisions, however, are still unclear.

BOX 2
MAJOR FEDERAL ENVIRONMENTAL LAWS

The *Federal Water Pollution Control Act of 1952* and the *Air Pollution Control Act of 1955* were the first two major statutes regulating emissions of hazardous substances in the air and water--the most likely channels for human exposure to hazardous waste. The Congress significantly strengthened these laws in the *Clean Air Amendments of 1970* (known as the Clean Air Act) and the *Federal Water Pollution Control Act Amendments of 1972* (known as the Clean Water Act).

The *Federal Environmental Pesticide Control Act of 1972* regulated the manufacture and use of pesticides and pesticide products to ensure safety according to directions on their labels. This act was amended by the *Federal Insecticide, Fungicide, and Rodenticide Act of 1975*.

The *Safe Drinking Water Act of 1974* aimed at protecting the public from various contaminants in the drinking water supply.

The *Toxic Substances Control Act of 1976* gave the Environmental Protection Agency (EPA) broader regulatory authority to identify and control chemical products that may threaten human health through their manufacture, commercial distribution, or disposal.

The *Resource Conservation and Recovery Act of 1976* (RCRA) provided for the overall management of hazardous wastes. RCRA established appropriate techniques and regulations for handling all hazardous wastes from "cradle to grave"--that is, from generation to disposal.

The *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) addressed a problem relatively ignored by RCRA--what to do about hazardous waste contamination from past disposal activities. CERCLA established a federal program, commonly known as Superfund, that would finance the cleanup of the nation's most contaminated waste sites. Superfund set detailed guidelines for cleaning up these sites and established a system of legal liability by which those responsible for the wastes would be forced to pay for their cleanup.

The *Hazardous and Solid Waste Amendments of 1984* significantly strengthened RCRA, primarily in response to EPA's slow progress in implementing it. These amendments also required the cleanup of contamination from leaking underground storage tanks, which CERCLA did not regulate.

The *Superfund Amendments and Reauthorization Act of 1986* (SARA) then strengthened CERCLA and significantly increased its fund from $1.6 billion to $8.5 billion to clean up the nation's most contaminated hazardous waste sites. SARA provided EPA with greater enforcement authority over those responsible for hazardous wastes, emphasizing permanent solutions rather than merely removal and relocation. SARA also mandated federal agencies to identify, investigate, and clean up any hazardous waste sites at their facilities.

The *Atomic Energy Act of 1954* still regulates the handling and storage of radioactive wastes, which are generated primarily at nuclear power reactors and at federal nuclear weapons plants. Although radioactive wastes are specifically excluded under RCRA, hazardous waste sites contaminated with radioactive wastes are regulated under CERCLA.

States play an important role in regulating hazardous wastes. In some cases, states were the forerunners in implementing hazardous waste treatment and disposal requirements. In other cases, states followed the federal lead in developing hazardous wastes laws and regulatory programs, including their own Superfund programs. In general, most states have responsibility for enforcing RCRA provisions at federal facilities within their jurisdictions, subject to EPA oversight. The EPA, however, enforces investigations and cleanups under CERCLA.

The extra costs imposed by requiring federal compliance with state hazardous waste laws is unknown but is almost certainly quite large. Under CERCLA, all federal facilities must meet any state hazardous waste standards, regardless of the costs. While many state environmental programs are relatively new or are still developing, several states--such as California and New Jersey--impose stricter hazardous waste standards than RCRA and CERCLA. These stricter standards may cover hazardous wastes that are excluded under the federal statutes, impose greater limits on how wastes are disposed, or set higher levels of cleanup at different types of disposal sites.

Furthermore, states have the authority to levy fines against federal agencies whose facilities do not comply with RCRA or with state standards for waste treatment. This state authority also extends to federal agencies that do not meet cleanup provisions negotiated among states, federal agencies, and the EPA. States may also force a federal facility to shut down operations that are not in compliance with hazardous waste laws. Lawsuits initiated by states or private interests against federal facilities for noncompliance may further drive up federal costs.

FEDERAL AGENCIES WITH HAZARDOUS WASTE RESPONSIBILITIES

Almost all federal agencies have previously or are currently generating or handling hazardous wastes. As a result, many agencies face potentially large liabilities for inadequate waste-handling and disposal practices, some of which have resulted in contaminated facilities. These practices may have met the standards enforced when the problems were created, but they do not meet the more stringent standards now. (See *Federal Agency Summaries* printed separately as a supplement to this CBO study.)

Federal Facilities Generating Hazardous Wastes

EPA defines a federal *facility* as an installation or landholding encompassing all contiguous land owned by a department or agency of the United States. Such federal facilities include defense installations, research laboratories, government office buildings, national parks, and national forests. A hazardous waste *site* is a specific place containing hazardous wastes and, therefore, one facility or installation may include numerous sites. The Hanford Reservation, located in Washington state, is only 1 facility, but it has over 3,000 hazardous waste sites resulting from nuclear weapons activities since the 1940s.

The Department of Defense (DoD) has, by far, the largest number of facilities that generate and dispose of hazardous wastes (1,579) and, similarly, the greatest number of hazardous waste sites (14,401). DoD installations generate hazardous wastes primarily through industrial operations to repair and maintain military equipment and through services provided by medical clinics, paint shops, fire departments, and laundries. Manufacturing and testing weapons at Army ammunition plants and proving grounds have caused some of the most serious contamination problems.

The Department of Energy (DOE) has fewer facilities with known or potential hazardous waste problems than does DoD. Yet, DOE's nuclear weapons complex has 20 facilities with highly toxic hazardous wastes--in fact, the most serious and costly contamination problem facing the federal government. DOE weapons plants generate hazardous wastes primarily through the research, development, production, and testing of nuclear weapons. Over the last five decades, large quantities of nuclear materials and toxic chemicals have accumulated, primarily in the production of plutonium. DOE also operates numerous nondefense research laboratories and electricity-generating plants that produce hazardous wastes. Many of these facilities will require cleanup.

Federal research laboratories use and dispose of many different types of hazardous materials. These laboratories are owned by EPA, the U.S. Department of Agriculture (USDA), the Department of Health and Human Services (HHS), the National Aeronautics and Space Administration (NASA), and the Department of Transportation's (DOT's) Federal Aviation Administration (FAA). The Coast Guard manages many maintenance and repair facilities that generate hazardous wastes, such as fuel oils, paints, degreasers, and other solvents. The General Services Administration (GSA) owns some federal office buildings contaminated with hazardous wastes, especially asbestos and polychlorinated biphenyls (PCBs). Other potential liabilities result from hazardous waste activities carried out at federal penitentiaries operated by the Department of Justice (DOJ). These activities include metalworking, printmaking, and woodworking by inmates.

Federal Agency Liabilities for Hazardous Wastes

Public lands--including national parks, national forests, wildlife refuges, and lands managed by the Bureau of Land Management (BLM) under the Department of the Interior (DOI)--contain many hazardous waste sites for which the federal government is liable. By law, the federal government must promote multiple uses on most public lands, ranging from recreational activities, such as camping and hiking, to various commercial activities. Thus, numerous sites for commercial mining operations and gas and oil exploration exist within the national parks and national forests. These sites, consequently, are contaminated with residual ores and chemicals used in the extraction processes. Most of these mining sites are now abandoned. The federal agencies involved are left with the responsibility of funding any cleanup efforts that CERCLA may require. Numerous municipal landfills also operate on public lands leased from these federal agencies. Some of these landfills, too, may contain hazardous wastes.

Federal lending agencies--such as the Small Business Administration (SBA), the Economic Development Administration (EDA), the Farmers Home Administration (FmHA), and the Resolution Trust Corporation--may be liable for cleaning up hazardous wastes at industrial and commercial properties acquired through foreclosure. These agencies did not create the contamination, but CERCLA requires federal agencies to clean up properties before reselling them. A possible indirect cost of this liability is the resulting disincentive to foreclose on such properties. CERCLA also holds credit agencies liable for cleanup costs at privately owned sites where EPA determines that their loans enabled the owners to continue the activities that resulted in contamination.

The hazardous waste problems at facilities currently owned or operated by the federal government represent only part of its responsibility. The government is also responsible for hazardous waste problems that have occurred at facilities that it no longer owns or never owned. DoD itself is responsible for more than 7,000 formerly owned sites that DoD is investigating for contamination. The DOJ incurs costs of cleaning up hazardous waste at illegal drug laboratories confiscated by federal agents. Federal agencies are also liable for cleanup costs at private sites where they contributed to the contamination.

EXTENT AND DEGREE OF CONTAMINATION AT FEDERAL FACILITIES

Currently, more than 2,300 facilities owned by federal agencies handle hazardous wastes or contain hazardous waste contamination. More than 7,100 properties formerly owned by federal agencies may incur financial liabilities from contamination problems. Federal agencies will likely discover additional federal liabilities from hazardous wastes as they continue to assess their hazardous waste activities and requirements.

The Federal Agency Hazardous Waste Compliance Docket, compiled by EPA, is a list of federally owned facilities that handle or store hazardous wastes or that contain actual contamination problems. This *docket* is the primary source of information about the number of facilities with potential hazardous waste problems. The docket includes facilities that fully comply with current regulations, as well as those that require compliance or cleanup activities. Nevertheless, the docket is not inclusive. This CBO study is supplemented, therefore, with other sources of data. The docket of November 16, 1988--an update of the original February 1988 docket--contains 1,099 federal facilities, as shown in Summary Table 1. EPA published the second docket update on December 15, 1989, listing 1,268 federal facilities. This CBO study bases its analysis on the November 1988 update in order to reflect the progress that federal agencies have made in investigating and cleaning up their facilities.

SUMMARY TABLE 1. NUMBER OF FEDERAL FACILITIES WITH POTENTIAL HAZARDOUS WASTE REQUIREMENTS, BY AGENCY

Agency	Docket Facilities	Other Facilities[a]
Department of Agriculture	39	52
Department of Defense	572	8,125
Department of Energy	66	42
Department of the Interior	263[b]	74
Department of Transportation	48	53
Other Agencies	111	11
Total	1,099[c]	8,357

SOURCE: Federal Agency Hazardous Waste Compliance Docket, November 16, 1988, update, and the Congressional Budget Office based on conversations and written information from federal agency officials.

a. Represents 7,147 formerly owned federal facilities that are not included on the docket and 1,210 currently owned federal facilities identified by the agencies. Of the latter, 1,007 are defense installations listed in the Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program. These facilities were not listed in the November 1988 docket update but may be in subsequent updates.

b. Almost 200 of these are individual hazardous waste sites, such as landfills and mines on public lands managed by the Bureau of Land Management, rather than standard federal facilities that sometimes contain multiple sites.

c. Differs from the published total of 1,170 federal facilities as some facilities were listed twice, some were not owned by the agency listed, and some did not meet the reporting requirements for inclusion.

The number of docket facilities each agency owns varies greatly. Over 50 percent of the docket facilities are DoD installations. While DOI appears to have a substantial number of facilities with potential hazardous waste problems, relative to other agencies, this number is deceiving. Almost 200 of the DOI docket entries are not standard federal facilities, which sometimes have multiple hazardous waste sites. Rather, these DOI entries represent individual hazardous waste sites, such as landfills and mines on BLM-managed public lands. EPA and DOI officials could not combine individual waste sites under specific "facilities" as they do for other docket entries, such as national parks, because of the indistinct boundaries of BLM lands.

The docket lists the number of federal facilities that generate and dispose of hazardous wastes or contain known contamination; beyond this, however, the docket has limited usefulness. The seriousness of contamination problems varies greatly among facilities. About 40 percent of the docket facilities listed had reported a hazardous waste release, but cleanup may or may not be required. Although potentially harmful, releases range from relatively minor at remote hazardous waste sites on public lands to extremely toxic radioactive wastes at nuclear weapons plants. DOE's hazardous waste problems may appear small judging by the number of DOE docket facilities. The cost of cleaning up the contamination at DOE's Hanford Reservation alone, however, may exceed the federal cleanup costs of all other agencies combined.

The National Priorities List (NPL) is a second source of information about hazardous waste problems facing the federal government. Facilities, both public and private, that are on the NPL are those judged by the EPA to present the greatest risks to human health and the environment. These facilities must be cleaned up under specific CERCLA standards, and so are sometimes referred to as Superfund sites. As of November 1989, 1,219 facilities were either listed on the NPL or proposed for future listing. Federal facilities account for 114 or about 10 percent of all NPL sites. DoD owns 92 of these. Of the remaining 22 federal facilities on the NPL, 10 are DOE weapons facilities.

This CBO study also includes 8,357 facilities that federal agencies identified as having potential hazardous waste contamination problems that the docket does not include, as shown in Summary Table 1. Of these, 7,147 are formerly federal owned facilities, and 1,210 are currently owned federal facilities. The latter are excluded from the docket primarily because the agency has not yet or has only recently reported them to the EPA. These currently owned federal facilities may appear in future docket updates.

Status of Agency Efforts to Clean Up Federal Facilities

Federal agencies have not completed much cleanup so far. Some progress has been made, however, in evaluating the extent of hazardous waste problems. Most agencies have completed initial assessments of contamination problems at their facilities on the federal docket. Yet, agencies have completed few of the more detailed investigations required at the most seriously contaminated facilities. RCRA and CERCLA specify stages of investigation and cleanup for hazardous waste sites. SARA requires initial assessments and establishes some cleanup schedules specifically for federal facilities. Over the next few years, agencies expect to continue their investigations. When completed, the investigations will provide the information needed to project the amount and timing of federal spending that cleanup will require.

Agencies have indicated that 375 of the 1,099 docket facilities--or 34 percent of all docket facilities--are not expected to need further investigation or cleanup, as shown in Summary Table 2. At the remaining 724 docket facilities that may require hazardous waste cleanup, agencies have completed only 29 comprehensive investigations, referred to as a Remedial Investigation/Feasibility Study (RI/FS). All facilities on the NPL must undergo an RI/FS. The RI/FS characterizes the type and extent of contamination, the associated risks to human health and the environment, and the types and costs of various cleanup options. The total number of federal facilities that will eventually require extensive cleanup is uncertain. Still, almost all of the 114 federal facilities on the NPL will undergo major cleanup once the required RI/FSs have been submitted to EPA.

Federal agencies indicated that only 30 docket facilities have been cleaned up. Some of these facilities had only small contamination problems; most of these were relatively minor individual waste sites located on public lands. Since these facilities were not on the NPL, the RI/FS procedure was not required. Cleanup continues at other federal docket facilities, but mostly involves only removing the hazardous wastes to reduce imminent threats to human health. At many of these

SUMMARY TABLE 2. NUMBER AND STATUS OF FACILITIES LISTED ON THE FEDERAL AGENCY HAZARDOUS WASTE COMPLIANCE DOCKET, BY AGENCY

Agency	Total Docket Facilities	No Further Action Needed[a]	Remedial Investigation/ Feasibility Study Complete	Cleanup Under Way[b]	Cleanup Complete
Department of Agriculture	39	12	0	1	1
Department of Defense	572	111[c]	25	51	3
Department of Energy	66	6	0	20	3
Department of the Interior	263	151	2	2	15
Department of Transportation	48	24	2	3	0
Other Agencies	111	71	0	9	8
Total	1,099	375	29	86	30

SOURCES: Congressional Budget Office based on conversations and written information from federal agency officials, and agency annual reports to the Congress on hazardous waste activities for fiscal year 1988.

a. As indicated by the agency; the Environmental Protection Agency has not yet determined whether further investigations or cleanup activities will be necessary at most facilities.

b. Includes interim cleanup activities, corrective actions taken under requirements of the Resource Conservation and Recovery Act of 1976, and remedial activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

c. The Department of Defense provided no information on the number of its docket facilities where no further action was expected to be needed. The Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program stated that about 70 percent of DoD's sites that were investigated so far required further investigation or cleanup activity. This estimate of 111 facilities represents 30 percent of the 369 DoD docket facilities with completed initial assessments.

facilities, long-term cleanup projects may be needed in addition, such as treating contaminated soil or groundwater.

Similarly, agencies have initiated few detailed investigations at the 8,357 facilities that are not on the federal docket. Yet, these non-docket facilities may have significant hazardous waste problems for which the federal government is liable. Cleanup activities have been completed or at least started at fewer than 200 of these facilities, most of which represent limited cleanup at defense sites.

EFFECT OF COMPLIANCE AND CLEANUP REQUIREMENTS ON THE FEDERAL BUDGET

Federal agencies will spend over $4 billion in fiscal year 1990 striving to comply with federal and state hazardous waste laws. Until recently, the primary effect of RCRA and CERCLA on the federal budget was the administrative costs to EPA--that is, costs for designing, implementing, and enforcing the hazardous waste laws. The federal costs of complying with these laws, however, now outweighs the costs of administering them. Future compliance and cleanup costs will almost certainly rise significantly above current levels. To estimate future funding needs, several categories of costs must be considered:

- *Operational compliance* with hazardous waste treatment laws on a routine, ongoing basis at all federal facilities;
- *Corrective action* on currently improper or inadequate hazardous waste treatment and disposal practices to bring operating facilities into compliance;
- *Investigation and cleanup* of hazardous waste contamination at inactive sites, often referred to as environmental remediation or restoration; and
- *Research and development* in reducing wastes, designing better cleanup technologies, and disposing of radioactive wastes permanently.

The chart below provides examples of these categories of costs. Generally, operating facilities incur costs for corrective action under RCRA provisions, while inactive hazardous waste sites typically incur cleanup costs under CERCLA. Some active facilities, however, may contain inactive sites and thus incur costs under both RCRA and CERCLA. EPA and DOE primarily incur research costs.

Cost Category	Type of Action
Operational compliance:	Monitor soil and groundwater near hazardous waste disposal sites;
Corrective action:	Upgrade waste treatment and disposal facilities at operating facility;
Investigation and cleanup:	Remove and treat contaminated soil and groundwater; and
Research and development:	Design and demonstrate radioactive waste immobilization technologies.

Federal spending for hazardous waste requirements is not reflected in a single budget account. Agencies generally do not assign the costs of most operational compliance and many corrective actions in specific environmental budget accounts. These costs are commonly included elsewhere in agency budgets, such as the operating budgets of individual facilities. Some agencies also include remedial investigation and small cleanup costs in their operating and maintenance budgets. The federal government's radioactive waste disposal program, managed by DOE, is funded partly by fees charged for nuclear-generated electricity as well as from DOE budgetary resources.

Current Federal Spending for Hazardous Waste Management and Cleanup

The Congress appropriated about $3.3 billion in fiscal year 1989 and $4.2 billion in fiscal year 1990 to federal agencies for specific hazardous waste activities, as shown in Summary Table 3. In addition, EPA's 1990 budget for managing the federal RCRA and CERCLA programs is about $2.1 billion. DOE and DoD, combined, received more than 95 percent of the 1989 and 1990 appropriations for corrective

SUMMARY TABLE 3. BUDGET APPROPRIATIONS FOR HAZARDOUS WASTE CLEANUP AND COMPLIANCE FOR FISCAL YEARS 1989 AND 1990, BY AGENCY
(In millions of dollars)

Agency	1989	1990
Department of Agriculture	5	20
Department of Defense	1,155	1,402
Department of Energy[a]	1,985	2,618
Environmental Protection Agency	1	1
Department of the Interior	16	24
Department of Justice	11	28
National Aeronautics and Space Administration	26	30
Postal Service	39	40
Tennessee Valley Authority	0	2
Department of Transportation	52	19
Veterans Administration	5	12
Total	3,295	4,196

SOURCE: Congressional Budget Office based on conversations and written information from federal agency officials.

NOTE: Only figures of the Department of Defense and the Department of Energy include hazardous waste compliance costs required under the Resource Conservation and Recovery Act of 1976; most of the funds appropriated to the other agencies cover mainly costs for investigation and cleanup of hazardous waste contamination.

a. Includes hazardous waste corrective actions, remedial activities, and waste management costs of $1,657 million in 1989 and $2,218 million in 1990, plus the costs of routine operational compliance of $328 million in 1989 and an estimated $400 million in 1990.

actions and for investigation and cleanup. DOE budget appropriations also include cost estimates of routine operational compliance. No other federal agencies had these estimates available. The budget figures for federal agencies other than DOE and DoD do not include all costs for corrective action and compliance with RCRA. While these compliance costs may be small, relative to DOE and DoD, they may be significant among all federal agencies.

Agency estimates for hazardous waste spending over the next five years are even more limited and incomplete. Only DOE has projected the full costs for its compliance, cleanup, and waste management activities between 1991 and 1995. DOE estimates these costs at more than $21 billion. This estimate represents annual hazardous waste spending over the five-year period at much more than the amount appropriated in 1990. DoD has requested $1.5 billion for fiscal year 1991, an 8 percent increase over its 1990 hazardous waste appropriations. DoD officials could not provide estimates of hazardous waste expenditures beyond 1991. In summer 1989, DoD projected its annual spending requirements for hazardous waste cleanup for the 1991-1995 period at about $500 million, the same amount spent in 1989. The Congress appropriated $601 million for these activities in 1990. DoD's budget request for hazardous waste cleanup in 1991 is now $817 million. Based on recent DoD appropriations and requests, funding estimates for DoD compliance and cleanup activities over the next five years could be as much as $9 billion.

Other federal agencies have indicated a need for budgetary resources of roughly $1.1 billion for hazardous waste activities over the 1991-1995 period. For the most part, these costs reflect hazardous waste projects planned for the next few years and not total hazardous waste spending for these agencies.

Long-Term Costs at Facilities of the Departments of Energy and Defense

Only DOE and DoD have provided preliminary estimates of the costs for carrying out anticipated hazardous waste activities in future years. In December 1988, DOE published *Environment, Safety, and Health*

Needs of the U.S. Department of Energy (known as the *Needs Report*). The *Needs Report* estimated that DOE's costs for environmental compliance and cleanup through the year 2010 would total between about $71 billion and $111 billion. These estimates reflect all environmental compliance, cleanup, and hazardous waste management costs, consistent with DOE's *Environmental Restoration and Waste Management Five-Year Plan*, published in September 1989. The estimates also include operational compliance costs but exclude costs for safety and health-related activities presented in the *Needs Report*. Estimates of the full costs of DoD's investigation and cleanup under CERCLA requirements range between $10 billion and $17 billion.

These long-term estimates of the spending requirements for hazardous waste activities at DOE and DoD are preliminary. The costs of cleanup projects now planned may decrease as new and more cost-effective technologies for waste treatment are developed. Spending will probably increase over time, however, as additional compliance and cleanup problems are discovered. This expectation is based, in part, on cleanup experience at private sites. Costs would also increase if new environmental legislation broadened federal liabilities for hazardous wastes or strengthened treatment and cleanup standards.

ISSUES BEFORE THE CONGRESS ABOUT FEDERAL HAZARDOUS WASTE REQUIREMENTS

Although difficult to estimate accurately, federal spending for compliance with federal and state hazardous waste requirements will be enormous. Federal costs for hazardous waste compliance and cleanup at defense and energy installations alone could approach $150 billion over the next 30 years. When the Congress passed RCRA, CERCLA, and, in particular, SARA and the Hazardous and Solid Waste Amendments, little knowledge was available about the effects of these programs on the federal budget.

Certain provisions in these statutes could even lead to greater federal liabilities and costs than are currently anticipated. State environmental requirements and enforcement authority over federal facilities will surely add to cleanup costs. Depending on judicial interpretations of federal liabilities under CERCLA, federal lending agencies may incur large costs on contaminated properties acquired through foreclosure. Final determination on specific standards required of federal facilities will also have major implications for the costs of cleaning up nuclear weapons plants. Currently, DOE officials and the General Accounting Office have indicated radioactive contamination so extensive at several of these facilities, such as the Hanford Reservation, that complete cleanup may be technically and economically unfeasible. In that case, the contaminated areas, which have been referred to as *National Sacrifice Zones*, would be permanently sealed off from public access.

As the Congress faces increasing budget requests for hazardous waste cleanup, decisions must be made to allocate limited resources among contending priorities. As EPA Administrator William K. Reilly told the Senate Committee on Environment and Public Works:

> The [Superfund] program can pursue either complete cleanup at some sites, or incremental cleanup at many sites. It cannot fully accommodate both goals simultaneously.

The Congress needs to know the size and the relative risks of various hazardous waste problems in order to allocate available funds effectively. Yet, little is currently known about the direct effects of human exposure to hazardous wastes. These health risks vary according to the type of contaminant, the degree of human exposure, and the disposal of the particular waste. Approximating the relative risks to health and the benefits of hazardous waste regulations is difficult. Targeting federal resources efficiently on this limited basis is even more difficult.

How much specific cleanup standards may cost to meet is generally not a major consideration in RCRA and CERCLA provisions. CERCLA does include cost as one factor used to select appropriate cleanup technologies at Superfund sites. The technical requirements for cleanup standards, however, predominate the selection process. State environmental statutes, which federal agencies are required to meet, generally do not take costs into consideration.

The lack of a governmentwide system for evaluating the comparative risks of contamination at federal facilities poses problems for the Congress in appropriating funds. Currently, each federal agency determines how much money to request for specific environmental activities at its own facilities. Without a governmentwide priority system, the Congress cannot evaluate and compare these budget requests. A relatively minor contamination problem at a remote and abandoned mining site, consequently, may be cleaned up before a weapons site that poses more of a threat to human health.

On a broader scale, the Congress must weigh the costs and benefits of hazardous waste regulations at federal facilities against other sources of environmental pollution. A 1989 EPA report, *Comparing Risks and Setting Environmental Priorities*, placed the risks from hazardous waste sites among the lowest the agency has to address. The report concluded that the highest risks to human health came from air pollutants (such as radon), from pesticides, and from drinking water contamination. The report found that EPA had allocated substantially more resources to the relatively low-risk hazardous waste problems than to the high-risk radon and pesticides problems. Current and future costs incurred by federal agencies for hazardous waste activities must also compete with the costs of other national goals.

CHAPTER I

TYPE AND EXTENT OF HAZARDOUS WASTES AT FEDERAL FACILITIES

Most federal agencies deal with some hazardous wastes and thus face compliance with federal and state regulations. This federal responsibility differs according to the facilities where federal agencies manage hazardous materials and the activities that generate the wastes as well as to the type and degree of contamination that exists. This Congressional Budget Office study attempts to provide the Congress with a benchmark for the types of hazardous waste problems facing each federal agency and for the status of federal agencies in addressing these problems.

The federal government generates, transports, stores, and disposes of hazardous wastes in many diverse operations. The most toxic and costly problems occur in nuclear weapons production where large amounts of radioactive and other extremely hazardous wastes contaminate the facilities. The government also leases portions of the nation's public lands for commercial operations, such as landfilling and mining, which often result in contamination for which the federal government is responsible. Other federal activities involving hazardous wastes include replacing a leaking underground storage tank at a federal post office, installing a monitoring well at a federal prison to detect hazardous wastes in the soil or groundwater, and cleaning up a release of freon at a thermochemical test area at a space flight center.

About 2,300 currently owned federal facilities have compliance requirements for hazardous waste activities. The Department of Energy and Department of Defense account for the bulk of federal activities that generate hazardous wastes and the consequent contamination problems for which the federal government is liable. The government may also be liable for potential problems resulting from hazardous waste activities at more than 7,100 sites formerly owned by the federal government. In addition, the federal government may be liable for contamination problems at privately owned properties acquired through foreclosure under federal credit programs. Further, the federal government may be liable for at least part of the cleanup costs at privately owned properties where federal agencies may have contributed to a contamination problem.

TYPES OF FEDERAL ACTIVITIES WITH HAZARDOUS WASTE REQUIREMENTS

Federal facilities differ widely in terms of the type of hazardous wastes found and the activities generating them. Thus, generalizations about contamination, compliance, or cleanup at a typical federal facility are themselves hazardous. The numerous federal activities that have led to hazardous waste contamination and the various federal liabilities that are subject to hazardous waste regulations account for the diversity of responsibilities facing the federal government. Table 1 lists federal facilities by activity to group those that may have similar hazardous waste problems.

DoD operates the largest number of facilities that generate hazardous wastes, most of which are forts and bases of the Army, Navy, or Air Force. These DoD facilities support many small industrial operations, such as vehicle and airplane maintenance, painting, and metalplating. Most of the hazardous materials found at DoD's 1,579 facilities are typical of many industrial operations: heavy metals and paint waste, solvents and degreasers, volatile organic compounds, petroleum, oil, and other fuels. The toxic by-products of manufacturing munitions and explosives have contaminated the soil and groundwater of many plants and sites operated by DoD. Some locations contain unexploded bombs and other artillery disposed on site. Extensive hazardous waste contamination exists at about 20 Army ammunitions plants and testing sites. For example, the Rocky Mountain Arsenal, which produced nerve gas and other chemical weapons, is the most contaminated DoD facility.

DOE activities at nuclear weapons research labs, production plants, and test sites have generated the most extensive and costly contamination problems. According to DOE officials, the widespread radioactive and hazardous waste contamination at many weapons facilities reflects DOE's effort to meet the production goals of DoD's nuclear weapons program rather than to comply with hazardous waste laws. At many of these facilities, radioactive material and other toxic substances have contaminated the soil and groundwater. At some sites, the contamination has spread off-site and could endanger the

TABLE 1. NUMBER OF FEDERAL FACILITIES WITH POTENTIAL HAZARDOUS WASTE REQUIREMENTS, BY TYPE OF FACILITY

Type of Facility	Facilities
Army, Air Force, and Navy Bases (Department of Defense)	1,579[a]
Sites on Public Lands (Departments of the Interior and Agriculture)[b]	388
Nondefense Research and Testing Labs[c]	65
Hospitals and Medical Centers[d]	27
Energy Production Plants (Department of Energy and the Tennessee Valley Authority)	21
Nuclear Weapons Production Plants, Research Labs, and Weapons Test Sites (Department of Energy)	20

SOURCE: Federal Agency Hazardous Waste Compliance Docket, November 16, 1988, update, and agency annual reports to the Congress for fiscal years 1988 and 1989.

NOTE: Some of these facilities may have no known contamination, while others may have serious hazardous waste contamination.

a. Represents the defense installations included in the Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program. Also, these include 27 facilities of DoD's Defense Logistics Agency, as well as 1,552 Army, Navy, and Air Force facilities.

b. Includes individual hazardous waste sites on property under the Bureau of Land Management and separate facilities, such as national forests, national parks, fish and wildlife refuges, and facilities under the Bureau of Reclamation. Most of the sites are landfills, abandoned mines, and illegal dumping grounds.

c. Includes the Department of Energy, the Department of Agriculture, the Bureau of Mines within the Department of the Interior, the Tennessee Valley Authority, the Department of Commerce, the Environmental Protection Agency, and the National Aeronautics and Space Administration.

d. Includes the Veterans Administration, the Department of Defense, and the Department of Health and Human Services.

groundwater and thus the drinking water supplies of nearby properties. DOE is also currently managing five special remediation projects, which involve 29 former properties and other sites where radioactive contamination is being cleaned up.

The illegal dumping of hazardous wastes, their disposal in landfills, and their remains at mines have contaminated the nation's public lands. Currently, hazardous wastes contaminate at least 388 facilities and sites on public lands managed by the U.S. Department of Agriculture and the Department of the Interior, which include national forests and national parks. Problems at mining sites result from contaminants passing from discarded ore and other mining debris into the soil and groundwater. Most of these mines are now abandoned. Additional contaminated landfills and mines will probably be discovered as USDA and DOI continue to survey public lands for hazardous waste problems. Other federal facilities that generate hazardous wastes include research laboratories, test facilities and flight centers of the National Aeronautics and Space Administration, Coast Guard facilities, airports owned by the Department of Transportation, hospitals and medical centers, and federal office buildings.

Under provisions of the Comprehensive Environmental Response, Compensation and Liability Act, federal agencies also have responsibility for cleaning up contamination at formerly owned federal properties. The Department of Commerce (DOC) may be obligated to pay for cleanup at sites operated by the War Productions Board, a former DOC agency that monitored and operated industrial properties during World War II. DOC may be financially responsible for partial cleanup costs at the privately owned Avtex Fibers site in Virginia where the War Productions Board once operated. Similarly, the General Services Administration may be liable for cleaning up industrial properties that the War Assets Administration, a predecessor GSA agency, sold off after World War II.

The Department of Justice is responsible for confiscating illegal drug laboratories through criminal enforcement efforts. These laboratories often contain chemicals and contaminated glassware that are improperly handled. The Drug Enforcement Agency within DOJ is responsible for removing and disposing of contaminated materials at these laboratories. The U.S. Marshals Service, also within DOJ, must clean up any drug laboratories that DEA seizes before they can resell these properties.

Federal credit programs may also lead to large federal liabilities for hazardous waste cleanup. Federal agencies that provide loans--such as the Small Business Administration, the Economic Development Administration (within DOC), the Farmers Home Administration, and the Resolution Trust Corporation, which is responsible for selling insolvent thrift institutions--often acquire private properties through foreclosure actions. CERCLA requires federal agencies to clean up any properties contaminated with hazardous wastes before reselling them to recover loan losses. The SBA and the EDA have noted that their cleanup liabilities under this provision, if held up in court, could be enormous. In some cases, the cleanup costs may be greater than the resale value of the properties.[1]

Another provision in the Superfund Amendments and Reauthorization Act places financial responsibility for cleaning up private hazardous waste sites on any party who provided a loan to the owner. EPA must determine, however, whether the loan allowed the operator to continue the activities that caused the contamination. Federal credit agencies provide loans to business and farmers who often engage in activities that generate or use hazardous materials and thus may require cleanup. Claims for the recovery of costs against federal credit agencies may succeed because these agencies, more so than private lenders, often provide technical advice to businesses and, therefore, may be more liable. At this time, whether EPA will name lenders as Potentially Responsible Parties at hazardous waste sites is uncertain. EPA will likely consider the lender's role as an advisor to the operators of the facility as a major cause for liability.[2]

---

1. According to the Small Business Administration, federal lending agencies that obtain property through foreclosure should be exempt from cleanup obligations where they played no role in the contamination. The Department of Justice and the Environmental Protection Agency are evaluating this position. Their response will help clarify current and future federal liabilities at such properties.

2. The Environmental Protection Agency is currently investigating the extent of hazardous waste contamination at the Roebling Steel Plant in New Jersey, where the Economic Development Administration was the principal lender. As the agency in authority, the Department of Commerce may be partially liable for the cleanup costs, which are estimated to exceed $200 million.

EXTENT OF FEDERAL RESPONSIBILITIES FOR HAZARDOUS WASTES

The number of federal facilities that may require compliance or cleanup from hazardous waste activities is largely a function of how broadly liability for hazardous waste problems is ultimately defined. The primary source of data used in this study to develop an inventory of federal facilities with hazardous waste responsibilities was the Federal Agency Hazardous Waste Compliance Docket, established under SARA. Compiled by the EPA, this docket lists all federal facilities that have reported hazardous waste activities under three provisions of the Resource Conservation and Recovery Act and one of CERCLA. Such a listing includes most federal facilities that handle hazardous wastes or that have had hazardous waste spills or other types of contamination problems. Consequently, the docket identifies those facilities that may not fully comply with standards for hazardous waste management as well as those facilities that may have serious hazardous waste contamination. Table 2 lists the number of facilities on the docket by agency.

The docket update of November 16, 1988, contained 1,099 federal facilities. This listing, however, is not a complete accounting of federal hazardous waste activities and liabilities. The docket omits some facilities even where the federal government may incur costs for hazardous waste compliance or cleanup responsibilities. Facilities specifically omitted from the docket include formerly owned federal sites, private hazardous waste sites where the federal government contributed to the contamination, and federal facilities that generate small quantities of hazardous wastes. Also, the docket omits some federal facilities where agencies have not yet, or have only recently, reported hazardous waste activities to EPA.

Facilities Listed on the Federal Docket

RCRA and CERCLA require federal agencies to provide EPA with a history of their facilities that generate, transport, store, or dispose of

TABLE 2. NUMBER OF FACILITIES LISTED ON THE FEDERAL DOCKET, BY AGENCY

Agency	Facilities
Department of Agriculture	39
Army Corps of Engineers	17
Central Intelligence Agency	1
Department of Commerce	7
Department of Defense	572
Department of Energy	66
Environmental Protection Agency	14
General Services Administration	18
Health and Human Services	4
Department of the Interior	263
Department of Justice	2
National Aeronautics and Space Administration	12
Postal Service	5
Small Business Administration	1
Tennessee Valley Authority	17
Department of Transportation	48
Department of the Treasury	2
Veterans Administration	11
Total	1,099

SOURCE: Federal Agency Hazardous Waste Compliance Docket, November 16, 1988, update.

NOTES: The updated docket included 1,170 federal facilities; however, some are listed twice, some are not owned by the agency listed, and some did not meet the reporting requirements for inclusion. This table represents each agency's account of the number of facilities correctly attributed to that agency. Differences from the docket counts are explained in the *Federal Agency Summaries* printed separately as a supplement to this study.

The docket count represents the number of federal facilities with potential hazardous waste requirements at a given time and, thus, changes as the docket is updated.

hazardous materials or that have had some type of hazardous waste release or spill. From this data, EPA compiles the federal docket, updating it periodically. Regulatory authorities can use the docket data to track the progress of investigations and actual cleanup at those facilities. The categories for listing a facility on the federal docket provide a limited basis for assessing hazardous waste contamination. The four reporting categories are:

- RCRA Section 3005: facilities for which agencies have applied for an EPA permit for hazardous waste treatment, storage, or disposal activities;

- RCRA Section 3010: facilities where hazardous materials are generated, transported, treated, stored, or disposed;

- RCRA Section 3016: facilities with hazardous waste activities that federal agencies have reported in their inventories; and

- CERCLA Section 103: facilities for which agencies have reported any releases or spills of a hazardous substance.

Of 1,099 docket facilities listed, 434 reported hazardous waste releases or contamination only under CERCLA Section 103 or under RCRA Section 3016, as shown in Table 3. A facility that has reported some hazardous waste activity under RCRA Section 3016, but does not currently generate, transport, store, or dispose of hazardous materials, is assumed to have some type of hazardous waste contamination existing at the property. Reporting under RCRA Section 3005, 379 docket facilities or about 35 percent have applied for a RCRA permit to treat, store, or dispose of hazardous wastes. These facilities typically handle large quantities of hazardous wastes and thus, according to EPA, may have a greater potential for violations or spills. Of these facilities, 304 belong to DoD, and 33 belong to DOE. Of the total docket facilities listed, 130 facilities or about 12 percent are solely generators or transporters of hazardous waste. Such facilities have others treat, store, or dispose of their hazardous wastes and, thus, may have a lesser potential for violations or spills.

The docket provides a snapshot of the number of federal facilities with potential hazardous waste requirements at a given time. The actual docket count as of the November 16, 1988, update is 1,170 facilities, but the correct count is only 1,099. The docket lists some federal

TABLE 3. NUMBER OF FACILITIES REPORTED UNDER THE CATEGORIES OF THE FEDERAL DOCKET, BY AGENCY

Agency	Number of Facilities	RCRA, Section 3005	RCRA, Section 3010 Only	RCRA, Section 3016 or CERCLA Section 103 Only[a]
Department of Agriculture	39	2	2	28
Department of Defense	572	304	50	120
Department of Energy	66	33	2	22
Department of the Interior	263	7	14	231
Department of Transportation	48	4	23	11
Other Agencies	111	29	39	22
Total	1,099	379	130	434

SOURCE: Federal Agency Hazardous Waste Compliance Docket, November 16, 1988, update.

NOTES: Resource Conservation and Recovery Act of 1976, Section 3005: facilities that have applied for a permit from the Environmental Protection Agency for hazardous waste treatment, storage, or disposal.

Resource Conservation and Recovery Act of 1976, Section 3010: facilities that generate, transport, treat, store, or dispose more than 1,000 kilograms of hazardous materials in any month (those that generate less or are solely transporters were deleted in the November 1988 docket update).

Resource Conservation and Recovery Act of 1976, Section 3016: facilities that must be reported in agency inventories of any sites with hazardous waste activities.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, Section 103: facilities that have reported any releases or spills of hazardous substances.

a. A facility not currently generating, transporting, treating, storing, or disposing of hazardous materials but assumed to have contamination on site because some hazardous waste activity was reported under RCRA Section 3016.

TABLE 4 NUMBER OF FEDERAL FACILITIES LISTED ON THE FEDERAL DOCKET, BY LOCATION

Location	Department of Agriculture	Army Corps of Engineers	Central Intelligence Agency	Department of Commerce	Department of Defense	Department of Energy	Environmental Protection Agency	General Services Administration	Health and Human Services
Alabama	--	--	--	1	6	--	--	--	--
Alaska	--	--	--	--	43	--	--	--	--
Arizona	--	--	--	--	9	--	--	--	--
Arkansas	1	--	--	--	4	--	1	--	--
California	3	--	--	--	80	6	--	2	--
Colorado	--	--	--	--	9	5	1	--	--
Connecticut	--	--	--	--	3	1	--	--	--
Delaware	--	1	--	--	2	--	--	--	--
D.C.	--	--	--	--	8	--	--	2	1
Florida	2	--	--	--	22	1	1	--	--
Georgia	--	--	--	--	11	--	--	--	--
Hawaii	--	--	--	--	23	1	--	--	--
Idaho	2	--	--	--	1	2	--	--	--
Illinois	--	--	--	1	9	2	1	--	--
Indiana	--	--	--	1	7	--	--	1	--
Iowa	1	1	--	--	1	2	--	--	--
Kansas	--	--	--	--	5	--	1	--	--
Kentucky	--	--	--	--	4	1	--	--	--
Louisiana	2	--	--	--	5	1	--	--	--
Maine	--	--	--	--	7	--	--	--	--
Maryland	1	--	--	1	26	--	1	1	2
Massachusetts	--	--	--	--	9	--	--	--	--
Michigan	1	--	--	--	6	--	--	--	--
Minnesota	--	--	--	--	4	--	--	--	--
Mississippi	--	1	--	--	6	--	--	--	--
Missouri	--	--	--	--	10	2	1	2	--
Montana	1	--	--	--	1	1	--	--	--
Nebraska	2	--	--	--	4	--	--	--	--
Nevada	--	-	--	--	1	--	--	--	--
New Hampshire	--	--	--	--	3	--	--	--	--
New Jersey	--	--	--	1	11	5	1	3	--
New Mexico	3	--	--	--	5	2	--	--	--
New York	1	--	--	--	23	5	--	5	--
North Carolina	1	--	--	1	25	--	--	--	1
North Dakota	2	1	--	--	3	1	--	--	--
Ohio	1	1	--	--	11	3	3	--	--
Oklahoma	2	2	--	--	6	--	--	--	--
Oregon	--	3	--	--	3	2	--	--	--
Pennsylvania	1	--	--	1	15	2	--	--	--
Puerto Rico	--	--	--	--	6	1	--	--	--
Rhode Island	--	--	--	--	7	--	1	1	--
South Carolina	--	--	--	--	10	1	--	--	--
South Dakota	--	--	--	--	2	1	--	--	--
Tennessee	--	--	--	--	7	3	--	--	--
Texas	4	3	--	--	34	2	--	1	--
Utah	1	--	--	--	6	2	--	--	--
Vermont	2	--	--	--	--	--	--	--	--
Virginia	--	1	1	--	36	--	1	--	--
Washington	3	2	--	--	12	9	1	--	--
West Virginia	3	--	--	--	2	--	--	--	--
Wisconsin	3	1	--	--	4	--	--	--	--
Wyoming	--	--	--	--	1	--	--	--	--
Guam	--	--	--	--	--	--	--	--	--
Trust Territory	--	--	--	--	--	--	--	--	--
Total	39	17	1	7	572	66	14	18	4

SOURCE Federal Agency Hazardous Waste Compliance Docket, November 16, 1988, update. (Continued)

TABLE 4. (Continued)

Department of the Interior	Department of Justice	National Aeronautics Space Administration	Postal Service	Small Business Administration	Tennessee Valley Authority	Department of Transportation	Department of the Treasury	Veterans Administration	Total
--	--	--	--	--	8	--	--	--	15
20	--	--	--	--	--	8	--	--	71
20	--	--	--	--	--	--	--	--	29
1	--	--	--	--	--	--	--	--	7
20	1	3	--	--	--	5	--	--	120
15	--	--	1	--	--	2	--	--	33
--	--	--	--	--	--	2	--	--	6
1	--	--	--	--	--	--	--	--	4
--	--	--	--	--	--	--	1	--	12
2	--	1	--	--	--	4	--	--	33
--	--	--	--	--	--	--	--	1	12
2	--	--	--	--	--	--	--	--	26
44	--	--	--	--	--	--	--	--	49
1	--	--	--	--	--	--	--	--	14
--	--	--	--	--	--	--	--	--	9
--	--	--	--	--	--	--	--	--	5
--	--	--	--	--	--	--	--	--	6
--	--	--	--	--	--	--	--	--	5
3	--	1	--	--	--	1	--	1	14
--	--	--	--	--	--	1	--	--	8
1	--	1	--	--	--	2	--	--	36
2	--	--	3	--	--	2	--	1	17
--	--	--	--	--	--	2	--	--	9
--	--	--	1	--	--	1	--	--	6
	--	--	--	--	--	--	--	--	7
1	--	--	--	--	--	--	--	--	16
8	--	--	--	--	--	--	--	--	12
1	--	--	--	--	--	--	--	--	7
50	--	--	--	--	--	--	--	--	54
--	--	--	--	--	--	--	--	--	3
3	--	--	--	--	--	3	--	3	29
30	--	1	--	1	--	--	--	1	43
5	--	--	--	--	--	2	--	1	42
--	--	--	--	--	--	2	--	--	30
--	--	--	--	--	--	--	--	--	7
1	--	2	--	--	--	--	--	--	22
2	--	--	--	--	--	2	--	--	14
7	1	--	--	--	--	3	--	--	19
3	--	--	--	--	--	--	--	--	22
--	--	--	--	--	--	1	--	--	8
2	--	--	--	--	--	--	--	1	12
--	--	--	--	--	--	--	--	--	11
--	--	--	--	--	1	--	--	--	4
--	--	--	--	--	8	--	--	--	18
2	--	1	--	--	--	2	--	--	49
8	--	--	--	--	--	--	--	--	17
--	--	--	--	--	--	--	--	--	2
2	--	2	--	--	--	1	--	--	44
6	--	--	--	--	--	2	1	--	36
--	--	--	--	--	--	--	--	--	3
--	--	--	--	--	--	1	--	1	10
--	--	--	--	--	--	--	--	1	2
--	--	--	--	--	--	--	--	--	8
--	--	--	--	--	--	--	--	--	2
263	2	12	5	1	17	48	2	11	1,099

NOTE Dashes indicate no facilities.

facilities twice; some as federal that are not; and some that did not meet the reporting requirements for inclusion. The original docket (published on February 12, 1988) listed 1,245 federal facilities. The November 1988 update contained numerous removals, additions, and corrections, resulting in a net decrease of 75 facilities. EPA recently updated the docket again. This December 1989 update contains 1,268 federal facilities, although how many of these may be improperly listed is unclear. This CBO study uses the November 1988 docket update in order to assess the progress that agencies have made at these facilities.

DoD has the greatest number of facilities on the November 1988 docket. In fact, more than one-half of the 1,099 docket facilities belong to DoD. Of these, 169 are Army installations; 182, Navy; 193, Air Force; and the rest are part of DoD's Defense Logistics Agency. DOE has 66 facilities on the docket reporting hazardous waste management or cleanup requirements; 18 of these facilities form the defense weapons complex where the nation's nuclear weapons are developed, produced, and tested. The Bureau of Land Management is responsible for 199 of the 263 docket facilities listed for DOI. Another 15 federal agencies have reported facilities with hazardous waste activities.

Geographical Distribution of Docket Facilities. The docket lists federal facilities in all 50 states as well as in Washington, D.C., Puerto Rico, Guam, and the Trust Territories of the Pacific Islands. Table 4 on page 10 shows the distribution of these facilities by location. Of the 1,099 federal docket facilities, 12 states contain over 30 facilities each, accounting for more than one-half of the total. Of these 606 docket entries, DoD owns 297, and DOI manages 195. About 30 percent of these DOI entries are landfills and abandoned mines on public lands managed by BLM. Generally found in remote western areas, these sites represent more of a threat to the environment than to human health.

Federal Facilities on the National Priorities List. Under the authority of CERCLA, the EPA established the Hazard Ranking System (HRS) to evaluate and rank hazardous waste sites, both federal and private, based on their threat to human health and the environment. Sites or facilities that pose the greatest risks (that is, the highest rankings) are included on EPA's National Priorities List. These high-priority sites must meet the cleanup standards and requirements of CERCLA.

Thus, the NPL provides one indicator of which facilities have serious hazardous waste problems that may take considerable federal spending over many years to clean up.

Currently, 1,219 facilities are on or proposed for the NPL as of November 1989. About 10 percent (or 114 facilities: 78 on the NPL and 36 proposed) are federal facilities, as shown in Table 5. As federally owned properties, they are also listed on the federal docket. These 114 facilities on the NPL are distributed among 39 states and Puerto Rico. Two states, California and Washington, have more than 10 of these federal facilities each. DoD is responsible for 19 of the 21 federal NPL

TABLE 5. NUMBER OF FEDERAL FACILITIES ON OR PROPOSED FOR THE NATIONAL PRIORITIES LIST, BY AGENCY

	National Priorities List	Proposed	Total
Department of Agriculture	1	0	1
Department of Defense[a]	59	33	92
Department of Energy[b]	16	1	17
Department of the Interior	1	1	2
Small Business Administration	1	0	1
Department of Transportation	0	1	1
Total	78	36	114

SOURCES: The National Priorities List, November 1989 update, and Congressional Budget Office based on conversations with federal agency officials.

a. Of the 59 Department of Defense facilities on the NPL, 2 list 2 different sites; 1 of the 33 proposed NPL installations lists 2 proposed sites.

b. The Department of Energy's Hanford Facility in Washington has 4 separate sites listed on the NPL; 3 of the 16 NPL facilities are listed as different sites at 1 facility--the Oak Ridge Reservation in Tennessee; the 1 proposed DOE facility is a separate site of a facility currently on the NPL--the Lawrence Livermore Laboratory in California.

facilities in California and for 8 of the 11 NPL facilities in Washington. Like the federal docket, the NPL also changes its count when facilities ranked as high-priority are cleaned up, delisted, or added. Six federal agencies own the 114 federal facilities that are currently on or proposed for the NPL.

- USDA's Agriculture Research Service in Washington has a laboratory with hazardous waste problems less serious than initially assumed and may be delisted shortly.
- DoD owns 92 NPL facilities, which include the Army's Rocky Mountain Arsenal, numerous other Army ammunition plants and forts, Air Force and Navy bases, as well as other military installations.
- DOE has 16 NPL facilities, 9 of which are nuclear weapons facilities. (One of these facilities has a separate site that is proposed for the NPL.)
- DOI has one NPL facility--the Crab Orchard National Wildlife Refuge in Illinois, owned by DOI's Fish and Wildlife Service. Most of the liability for the many hazardous waste sites located at this wildlife refuge belongs to the Sangamo Corporation, a defense contractor that operated a manufacturing plant at this refuge. BLM has an additional DOI facility proposed for the NPL--the Lee Acres Landfill in New Mexico.
- SBA owns one NPL site--the Cal West Metals Site in New Mexico, which was acquired through foreclosure on a loan provided to the site's former owners, who have paid for all the cleanup so far.
- DOT has one facility proposed for the NPL--a Technical Center in New Jersey owned by the Federal Aviation Administration.

Limitations of the Docket Data. While the federal docket provides the most complete inventory of federal facilities with hazardous waste activities, several factors limit its usefulness. The docket lists facilities with widely ranging hazardous waste activities and problems but gives no indication of the type or extent of contamination that may exist. Many of the facilities listed may not require any corrective action or cleanup beyond preliminary assessment and ongoing compliance. Other facilities may have very serious radioactive or hazardous waste problems. Thus, a comparison of the financial liabilities for hazardous wastes faced by each federal agency is not possible from the data available on the docket.

The docket lists only currently owned federal facilities and, thus, does not reflect the federal responsibilities at the 7,147 previously owned federal facilities that are being investigated for contamination. Under SARA, the liability for any cleanup may fall to the former federal owner. Federal agencies may also face large cleanup liabilities because of joint responsibility for contamination at private hazardous waste sites that are not included on the federal docket.

The docket omits sole transporters of hazardous waste and small generators of hazardous wastes (less than 1,000 kilograms in any month), even though these facilities face compliance with handling requirements for hazardous materials. The docket omits facilities whose federal agencies have only recently or not yet reported them to EPA. For example, a report on the hazardous waste compliance program at DOC claimed that three properties, which had not been reported to EPA, should be included on the docket.[3] Also, the USDA identified hazardous waste problems at 43 national forests that had not yet been included on the docket.

ADDITIONAL FEDERAL LIABILITIES FOR HAZARDOUS WASTES

To extend the data for this study beyond the federal docket, the Congressional Budget Office asked officials at each agency to identify additional facilities that might require financial resources to investigate or clean up hazardous waste problems. As the docket excludes some federal facilities that may incur considerable hazardous waste costs, this agencywide inventory provides a more complete picture of federal liabilities stemming from hazardous waste activities. Estimates of the number of these nondocket facilities for which each agency is responsible are presented in Table 6. Federal agencies identified roughly 8,400 facilities that are not on the docket but that require investigation for hazardous waste problems.

---

[3] Argonne National Laboratory, *Assessment of Department of Commerce Hazardous Waste Compliance Programs* (March 15, 1989).

TABLE 6. NUMBER OF FEDERAL FACILITIES WITH POTENTIAL CONTAMINATION NOT LISTED ON THE FEDERAL DOCKET, BY AGENCY

Agency	Formerly Owned Sites	Agency-Owned Facilities	Total
Department of Agriculture	1	51	52
Department of Defense	7,118	1,007[a]	8,125
Department of Energy	25[b]	17[c]	42
Department of the Interior	1	73	74
Department of Transportation	1	52	53
Other Agencies	1	10	11
Total	7,147	1,210	8,357

SOURCE: Congressional Budget Office based on conversations and written information from federal agency officials.

NOTE: The number of facilities is based on agency estimates.

[a] Represents the 1,579 installations included in the Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program, excluding the 572 DoD installations listed on the November 1988 docket.

[b] The Department of Energy's Formerly Utilized Sites Remedial Action Project includes 29 sites, but 4 of these sites are listed on the docket (and on Table 2) because DOE now has title to some part of the facility.

[c] Several DOE facilities not on the docket have no contamination problems but were included in DOE environmental surveys because of other environmental compliance activities.

Formerly Owned Federal Facilities

Many formerly owned facilities may have no contamination problems or require only minor cleanup, while some facilities are so contaminated that they are on the NPL. The Army Corp of Engineers is responsible for investigating 7,118 of these properties that were formerly owned by DoD. There is some double-counting, however, among the former DoD properties and the docket listings of other federal agencies.[4] The Army Corps of Engineers has found contamination at about 20 percent of the 1,732 former DoD properties investigated so far.

The one hazardous waste facility formerly owned by the USDA is a grain storage silo in Nebraska. Once operated by the Commodity Credit Corporation (CCC), the site is currently listed on the NPL. Various fumigants that had been applied to the stored grain caused groundwater contamination. The USDA was liable for all costs of cleanup and water treatment and has already spent several million dollars. More than 2,000 such grain silos exist, and the number that may have caused soil or groundwater contamination is unknown.

DOE established a specific program to investigate, monitor, and clean up any radioactive contamination from nuclear activities at former properties. This program has 29 former sites of which the federal docket lists 4 because DOE currently maintains title to some property at those sites. Also covered by this DOE program are some privately owned sites that the Congress specifically asked DOE to evaluate and clean up.

The Robinson Brick Company Site in Colorado, formerly owned by DOI, is also listed on the NPL. Contamination was caused at this site from large quantities of radioactive waste. The Bureau of Mines within DOI is financially responsible for any cleanup required because of its past efforts to produce radium there.

The one formerly owned DOT facility is the Standard Steel and Metal Salvage Yard, located in Anchorage, Alaska. The Federal Railroad Administration once leased the land for this commercial property, whose owners have since declared bankruptcy. The Alaska Railroad now owns the site, which EPA has proposed for the NPL.

---

[4] The Fish and Wildlife Service in the Department of the Interior stated that 14 of the 26 wildlife refuges listed on the docket as DOI facilities are actually former properties of the Department of Defense for which DoD is responsible.

Currently Owned Federal Facilities

The bulk of the 1,210 facilities currently owned by federal agencies are DoD facilities. These facilities represent the remainder of the 1,579 installations included in the DoD Defense Environmental Restoration Program, minus the 572 DoD facilities in the November 1988 docket. The 17 DOE facilities listed in Table 6 represent those identified in the DOE *Needs Report* that were not listed on the docket. While most of these 17 facilities may require some hazardous waste cleanup, several facilities are under construction and have no contamination problems.[5] The *Needs Report* listed them either because of safety and health requirements or future environmental compliance.

Other agencies identified currently owned facilities for CBO's inventory because of problems of hazardous waste contamination that were suspected but not yet fully investigated. Most of the facilities identified by the USDA and the DOI are national forests and national parks that may contain contaminated landfills and abandoned mines. The 52 nondocket sites owned by DOT are Alaskan airstrips managed by the FAA. DOT has indicated that the contaminated sites at these facilities may be quite expensive to investigate and clean up because of local weather.

Privately Owned Sites With Potential Federal Liabilities

Federal agencies may be liable for part or all of the cleanup costs for hazardous wastes at some private sites, depending on the agency's involvement at the site. These sites are on the NPL but are not on the federal docket, which only includes facilities currently owned by a federal agency. At these Superfund sites, EPA may name a federal agency as a Potentially Responsible Party for cleanup liabilities because the agency either contributed to the contamination at the site or once owned the site. As of July 1989, EPA had identified 80 privately owned sites on the NPL where one or more federal agencies may be liable for cleanup costs. Table 7 shows the number of facilities at which federal agencies have been named Potentially Responsible Parties. The bulk of these privately owned sites are former DoD properties that are now on the NPL because of contamination from former DoD activities.

---

[5] These facilities currently being built include the Waste Isolation Pilot Plant in New Mexico and the Continuous Electron Beam Accelerator Facility in Virginia.

The extent of federal liability at hazardous waste sites that are privately owned is unclear. Most of these sites have not been cleaned up, nor has EPA allocated cleanup costs among the parties involved.

TABLE 7. NUMBER OF PRIVATELY OWNED SITES ON THE NATIONAL PRIORITIES LIST WHERE FEDERAL AGENCIES ARE A POTENTIALLY RESPONSIBLE PARTY, BY AGENCY

Agency	Facilities
Department of Agriculture	8
Department of Defense	61
Department of the Interior	8
Postal Service	7
Department of Transportation[a]	11
Veterans Administration	7
Other Agencies	36
Total	138[b]

SOURCE: Congressional Budget Office based on information provided by the Environmental Protection Agency in July 1989.

a. One site, currently proposed for the National Priorities List, has recently been sold to its operator, but the Department of Transportation may be financially liable as a former owner.

b. EPA has named federal agencies as Potentially Responsible Parties at 80 sites; at numerous sites, more than 1 agency has been named.

The level of federal responsibility in cleaning up these private Superfund sites will depend on the amount of contamination contributed by federal agencies and on the ability of other contributors or private owners to pay for any cleanup. Several federal agencies have indicated that their liabilities at some of these sites may be minimal because either the agency's contribution was minor or the agency was a former owner and not a contributor. Federal agencies are still potentially liable for full cleanup costs at these sites under the joint and several liability provisions of CERCLA.[6]

Limitations of the Inventory of Nondocket Facilities

The federal government will undoubtedly incur additional liabilities from hazardous waste compliance or cleanup requirements. As most federal agencies are still identifying hazardous waste problems at their properties, more contaminated facilities will surely be found. USDA and DOI, for example, have not comprehensively surveyed their landholdings for contamination because of the vast acreage and largely unsupervised nature of the public lands. Federal agencies may also be financially responsible for cleanup activities at additional privately owned sites, either as former owners or contributors to the contamination.

The facilities included in the federal docket and in CBO's inventory also excluded the numerous commercial properties with potential contamination problems on which the SBA and the EDA have foreclosed. At this time, these agencies are not able to estimate the number of such properties with potentially large liabilities. Furthermore, federal agencies are already incurring indirect costs by forfeiting ownership of properties that may be contaminated. To foreclose that option, the SBA and the EDA have adopted policies whereby properties must be evaluated for potential contamination before foreclosure. This provision could also change the lending practices of federal credit agencies, which might refuse loans to businesses that generate or handle hazardous wastes.

---

[6] These provisions allow the Environmental Protection Agency to hold any one Potentially Responsible Party liable for the full cleanup costs at an NPL site, even if EPA has identified other parties that have contributed to the contamination.

CHAPTER II

POTENTIAL FEDERAL LIABILITIES AND BUDGETARY IMPLICATIONS

The budgetary resources needed to meet hazardous waste requirements at federal facilities include the costs of operational compliance, corrective action, investigation, and cleanup. Almost all federal agencies perform some daily or ongoing operations to comply with federal and state standards for hazardous waste management. While costs of operational compliance may be small compared with cleanup costs, they may be significant among all federal agencies though not readily available. Such funds usually come from an agency's operating budget, targeted for specific facilities. In addition, many federal facilities do not fully comply with the waste management requirements under the Resource Conservation and Recovery Act. Consequently, some agencies may incur large costs for corrective actions to improve improper waste-handling practices, while others may incur only minor costs. The greatest costs will occur in future years as federal agencies begin to undertake the more extensive cleanup projects.

Agency efforts to reduce the amount of waste generated by federal activities and to develop more efficient cleanup technologies are another budgetary cost of hazardous wastes. These research and development (R&D) activities should reduce future disposal and cleanup costs. Research laboratories of the Department of Energy have the most extensive federal R&D efforts under way. Current hazardous waste statutes encourage waste reduction efforts, and some agencies have targeted reduction as an important part of hazardous waste requirements.

The greatest uncertainties and the largest liabilities for hazardous wastes stem from the investigation and cleanup costs at federal facilities. To determine the extent and timing of these potential costs, the Congressional Budget Office compiled a status report on each federal agency's progress in investigating and addressing problems of hazardous waste contamination (see *Federal Agency Summaries* as a supplement to this study). For the most part, these status reports reflect information the agencies provided to CBO during the first half of 1989.

STATUS OF HAZARDOUS WASTE INVESTIGATIONS BY FEDERAL AGENCIES

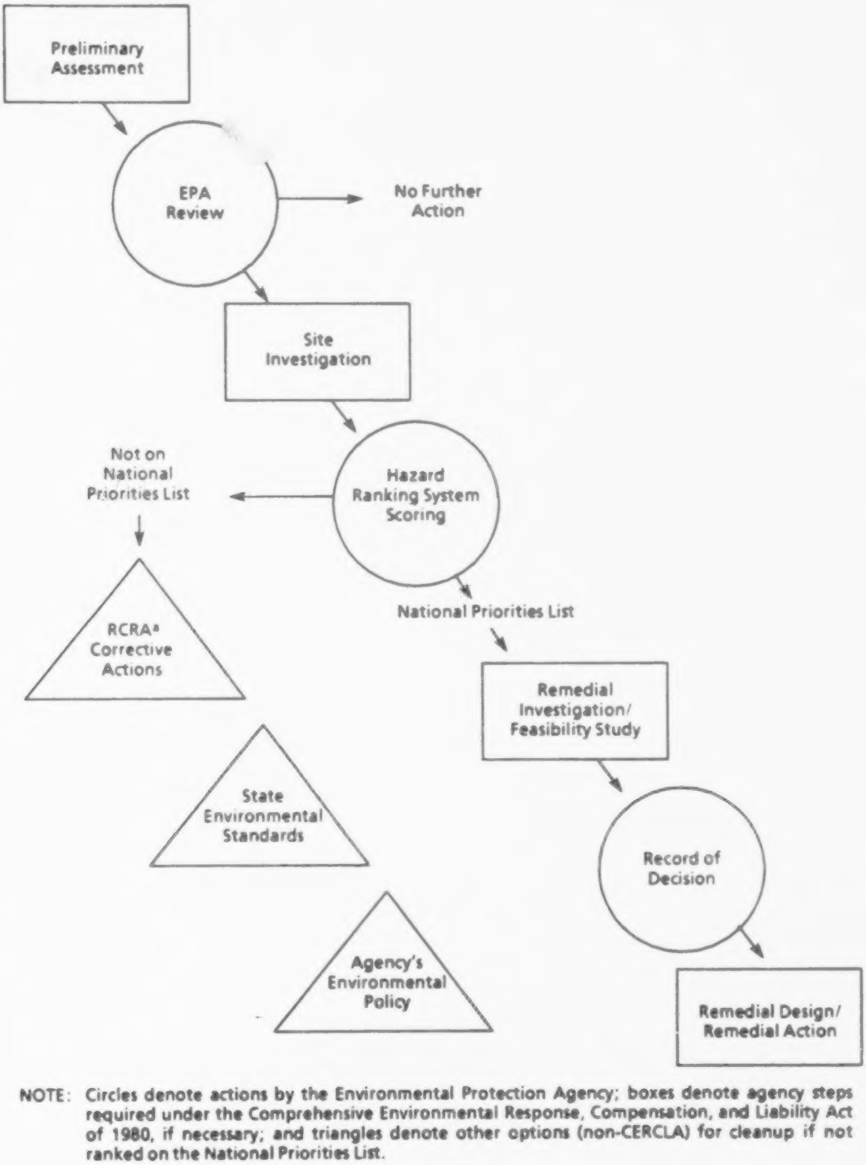
Agencies have completed few detailed investigations of hazardous waste contamination at their facilities. Over the next few years, most federal agencies will expand their efforts. These investigations will place agencies in a better position to estimate funding needs and to undertake the cleanup required for compliance with regulations. For the most part, agencies have conducted preliminary assessments at facilities listed on the November 1988 update of the federal docket. Many facilities with known hazardous waste problems need additional investigations, some of which are under way. Efforts to investigate hazardous waste problems at most facilities that are not on the docket have proceeded more slowly.

The Superfund Amendments and Reauthorization Act requires each federal agency to submit an annual report to the Congress describing the hazardous waste efforts under way at its docket facilities. Thus, problems at sites not on the federal docket may have to wait until after the legal requirements at docket sites have been met. Agencies receive less pressure to address the problems at nondocket facilities because of the lack of public awareness about many of these sites. Also, agencies with limited budgets for compliance and cleanup of hazardous wastes generally target facilities with the most serious problems--that is, facilities whose contamination problems are ranked high enough by the Environmental Protection Agency to be included on the National Priorities List.

Investigations at Facilities on the Federal Docket

SARA provisions established a specific schedule that federal agencies must follow in investigating docket facilities to determine whether hazardous waste problems exist. Figure 1 illustrates the stages for evaluation and cleanup required at a docket facility. For each facility,

Figure 1.
Stages of Investigation and Cleanup Required by Federal Facilities Listed on the Docket


Preliminary Assessment
EPA Review
No Further Action
Site Investigation
Not on National Priorities List
Hazard Ranking System Scoring
RCRA[a] Corrective Actions
National Priorities List
Remedial Investigation/ Feasibility Study
State Environmental Standards
Record of Decision
Agency's Environmental Policy
Remedial Design/ Remedial Action

NOTE: Circles denote actions by the Environmental Protection Agency; boxes denote agency steps required under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, if necessary; and triangles denote other options (non-CERCLA) for cleanup if not ranked on the National Priorities List.

a. Resource Conservation and Recovery Act of 1976.

the responsible federal agency must conduct a *preliminary assessment* of any contamination resulting from hazardous waste activities. An *EPA review* of this assessment determines whether further investigation is warranted. If so, the agency must conduct a *site investigation* at the facility. Based on those results, EPA ranks the facility according to the *Hazard Ranking System (HRS)*. EPA developed the HRS under the Comprehensive Environmental Response, Compensation, and Liability Act as a means to identify which hazardous waste sites are the greatest risks to human health and the environment.[1] If ranked high enough, the facility is put on the *National Priorities List*. This listing requires more detailed investigation before cleaning up the facility according to CERCLA standards. This *remedial investigation and feasibility study (RI/FS)* characterizes the extent of contamination and its threat to human health and the environment and then identifies appropriate cleanup technologies and costs. Once completed, the agency and EPA sign a *record of decision* for the facility. This decision specifies the cleanup projects that the agency will undertake at the facility to achieve the standards required under CERCLA. The final stage is the *remedial design and remedial action (RD/RA)*, which engineers the chosen cleanup program and then carries out the actual cleanup.

SARA required all facilities on the original docket, published on February 12, 1988, to submit preliminary assessments to EPA by April 1988. SARA further required facilities that are added to the docket in subsequent updates to complete these evaluations within 18 months of being listed on the docket. Agencies have completed preliminary assessments for about 70 percent of the 1,099 facilities on the November 1988 update of the docket. Over 40 percent of these facilities have completed site investigations, as shown in Table 8. Most of the facilities for which agencies have not yet completed preliminary assessments have until May 1990 to submit them to EPA. EPA added these facilities to the docket update of November 16, 1988.

---

1. The Environmental Protection Agency recently revised the Hazard Ranking System, putting more emphasis on the threat that hazardous wastes pose to the environment. Many facilities with hazardous waste sites located in remote areas, particularly national forests and landholdings within the Department of the Interior, may score high enough now to be added to the National Priorities List.

Several agencies have not completed the preliminary assessments on schedule as required for facilities listed on the original docket. The Department of Commerce has submitted the assessments for only 2 of its 12 docket facilities originally listed. The Department of the Interior has not completed assessments for some of its original docket listings. The Department of Transportation is currently conducting 12 of the required assessments for its facilities on the original docket.

TABLE 8. STATUS OF AGENCY INVESTIGATIONS AT FACILITIES LISTED ON THE FEDERAL DOCKET

Agency	Total Docket Facilities	No Further Action Needed[a]	Preliminary Assessment Complete	Site Investigation Complete	Remedial Investigation/ Feasibility Study Planned or Under Way	Remedial Investigation/ Feasibility Study Complete
Department of Agriculture	39	12	18	2	1	0
Department of Defense	572	111[b]	369[c]	369[c]	291	25
Department of Energy	66	6	50	43	27	0
Department of the Interior	263	151	211	27	3	2
Department of Transportation	48	24	36	5	2	2
Other Agencies	111	71	93	15	2	0
Total	1,099	375	777	461	326	29

SOURCES: Congressional Budget Office based on conversations and written information from federal agency officials, and agency annual reports to the Congress on hazardous waste activities for fiscal year 1988.

NOTE: At six of the facilities, a Facility Assessment or a Facility Investigation under the Resource Conservation and Recovery Act of 1976 substitutes for either an SI or RI/FS.

[a] As indicated by the agency; the Environmental Protection Agency has not yet determined whether further investigations or cleanup activities will be necessary at most facilities.

[b] The Department of Defense provided no information on the number of its docket facilities where no further action was expected to be needed. The Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program stated that about 70 percent of DoD sites that were investigated so far required further investigation or cleanup activity. This estimate of 111 facilities represents 30 percent of the 369 DoD docket facilities with completed initial assessments.

[c] DoD does not break out the PA and SI stages; at the end of fiscal year 1988, PAs and SIs had been completed on all sites at 369 DoD docket installations.

Based primarily on the 777 preliminary assessments completed, agencies expect that 375 docket facilities will require no further investigation or cleanup. The exact number of docket facilities belonging to the Department of Defense that require no further action is unknown. DoD indicated, however, that roughly 70 percent of DoD sites investigated so far will need further investigation or cleanup. Most of the facilities requiring no further action either generate, transport, treat, or dispose of hazardous materials where investigations have found no contamination problems. Several other facilities in this category are already cleaned up. At most of the remaining 402 federal docket facilities with completed preliminary assessments, the agencies indicate that further investigation is necessary as a result of suspected contamination problems. In addition, 322 docket facilities have not yet completed preliminary assessments.

Agencies have completed site investigations at 461 docket facilities and have 355 RI/FSs completed or under way. These investigations include RI/FSs for most of the 114 federal facilities on or proposed for the NPL. Agencies, particularly DoD and DOE, often undertake RI/FSs for facilities not on the NPL where they expect significant cleanup operations. (SARA only requires an RI/FS at NPL facilities.) Of these 355 facilities with serious contamination problems, agencies have completed only 29 detailed RI/FSs so far. Therefore, federal agencies are far from knowing the full extent of the contamination problems and associated liabilities at their facilities.

Negotiated Agreements for Federal Facilities on the National Priorities List. Under SARA, the relevant state together with the responsible federal agency and the EPA must negotiate an interagency agreement for any federal facility listed on the NPL. The three parties must initiate this Federal Facility Agreement within six months of EPA's review of the completed RI/FS. The interagency agreement allows the parties to review alternative cleanup options. The agreement also sets schedules to design and carry out the cleanup.

Through 1989, 74 such agreements had been signed or were being negotiated: 59 for DoD installations, and the remaining 15 for DOE facilities, 9 of which were nuclear weapons facilities. These agreements do not specify cost estimates for the required cleanup; they do require, however, that the responsible federal agency request sufficient funding in its budget appropriations to complete the cleanup on schedule. Thus, these agreements will help determine the extent and timing of federal liabilities at the most contaminated federal hazardous waste facilities.

Regardless of these legally enforceable agreements, the Congress will ultimately decide when and to what degree some federal facilities are cleaned up through the annual budget appropriation process. For example, the recent interagency agreement for the Hanford Reservation in Washington state commits DOE to undertake numerous cleanup activities through the year 2018. If the Congress does not appropriate the billions of dollars needed to complete the cleanup, the legal actions and enforcement authority that the state environmental agency or private citizens could take against DOE are unclear.

The overlapping statutory requirements of RCRA and CERCLA tend to complicate the negotiations for cleaning up federal facilities. In general, CERCLA standards require cleanup at inactive hazardous waste sites, while RCRA provisions require cleanup of hazardous wastes at currently operating facilities. Many active facilities include inactive hazardous waste sites and, thus, are subject to the requirements of both statutes. States primarily have authority to enforce cleanup activities under RCRA, while EPA has authority to enforce CERCLA. This split leads to problems over primary enforcement authority during negotiations on interagency agreements. For example, at DOE's Hanford Reservation, enforcement authority for cleaning up specific sites under RCRA was given to the state, while enforcement authority for cleaning up other sites on the same facility under CERCLA was given to EPA. At DoD's Rocky Mountain Arsenal, a Federal Facility Agreement has been signed by DoD, EPA, and several other parties. This interagency agreement designates certain cleanup schedules, but the state of Colorado has refused to sign the agreement so far. The state is unwilling to relinquish its authority to enforce RCRA standards for cleaning up some of the hazardous waste sites at the facility.

Investigations at Docket Facilities Not Subject to CERCLA. Docket facilities with contamination problems not serious enough to warrant inclusion on the NPL may be cleaned up under other hazardous waste statutes. For example, the docket includes many facilities whose hazardous waste activities are subject to certain RCRA provisions. If EPA notifies a federal agency that a facility is out of compliance with requirements under RCRA, the agency must take corrective measures to comply. These corrective measures, similar to requirements under CERCLA, may involve:

- A *RCRA facility assessment* (RFA) to determine whether corrective actions are warranted;
- A *RCRA facility investigation* (RFI) to evaluate the extent of the hazardous waste contamination; and
- A *corrective measures study* (CMS) to identify and evaluate alternatives for cleanup or compliance requirements (corrective actions) at the site.

Many federal facilities may need to take corrective actions under RCRA. For example, the Tennessee Valley Authority has completed an RFA for its National Fertilizer Development Center and a power storage area, both in Alabama. These facilities must carry out corrective actions under RCRA to receive and maintain RCRA permits for handling hazardous wastes.

Many states have also established their own hazardous waste programs. Cleanup standards and requirements for hazardous wastes under state law may be stricter than those under federal law. Thus, states may require facilities to clean up contamination problems that do not rank high enough to be regulated under the CERCLA statute.

Investigations At Facilities Not on the Federal Docket

Federal agencies are evaluating 8,357 of their currently or formerly owned facilities not on the docket for potential hazardous waste problems. The agencies have completed about 2,900 initial investigations at these facilities, as shown in Table 9. Most of these investigations are comparable to preliminary assessments. The bulk of these nondocket facilities are the 7,118 formerly used defense sites, many of which are not suspected of having hazardous waste problems. In fact, less than 20 percent of the 1,732 preliminary assessments completed so far at these properties have indicated any required cleanup. An official of the Army Corps of Engineers, which is responsible for investigating and cleaning up formerly used defense sites, indicated that this percentage is expected to remain steady for the assessments at the other 5,386 formerly used DoD sites. If so, roughly 1,400 of these 7,118 properties will require cleanup.

TABLE 9. STATUS OF AGENCY INVESTIGATIONS AT FACILITIES NOT LISTED ON THE FEDERAL DOCKET

Agency	Nondocket Facilities	Initial Assessments Complete
Department of Agriculture	52	48
Department of Defense[a]	8,125	2,709
Department of Energy	42	26
Department of the Interior	74	74
Department of Transportation	53	53
Other Agencies	11	10
Total	8,357	2,920

SOURCE: Congressional Budget Office based on conversations and written information from federal agency officials.

NOTE: Table includes 1,210 currently owned federal facilities with potential contamination problems, as well as the 7,147 formerly owned federal facilities that are represented in Table 6.

[a] Of the Department of Defense sites, 7,118 are formerly owned properties. In addition to 1,732 completed assessments, preliminary assessments are under way at 1,826 sites. At the 1,007 currently owned DoD facilities, 97 percent were assumed to have preliminary assessments completed--the same number of docket and nondocket DoD sites (not facilities) with initial assessments completed as of September 30, 1989.

This category of formerly owned federal facilities includes 29 other facilities, most of which have hazardous waste contamination problems.[2] The remaining nondocket facilities represent the 1,210 currently owned facilities, many of which federal agencies may report to EPA for future inclusion on the docket. These facilities must then undergo the formal SARA evaluation process.

STATUS OF CLEANUP EFFORTS AT FEDERAL FACILITIES

To date, federal agencies have planned or conducted only limited cleanup activities at their facilities. Most cleanup efforts now under way or planned for the near term are only temporary measures, primarily intended to prevent the spread of contamination that may pose an immediate and direct threat to human health and safety. For example, in 1988, DoD constructed alternative systems for water supply and treatment at three DoD installations where drinking water was contaminated by hazardous wastes. Agencies have not yet initiated many of the permanent cleanup solutions at facilities, such as the DOE weapons plants that are contaminated with highly radioactive wastes.

Cleanup at Facilities on the Federal Docket

Federal agencies have undertaken or completed cleanup efforts under RCRA or CERCLA, to some degree, at 116 facilities on the federal docket. About one-half of these facilities are DoD installations, as shown in Table 10. Of the 30 facilities that agencies indicated had been cleaned up, 15 are individual sites on public lands managed by DOI. Additional discoveries of hazardous waste contamination or changes in regulatory standards may require further cleanup at these facilities, such as happened at some privately owned hazardous waste sites cleaned up under the Superfund program.

---

[2] The exceptions are two Department of Energy facilities currently under construction. DOE identified these in its list of federal hazardous waste facilities because of future activities there for which hazardous waste compliance is expected.

TABLE 10. STATUS OF AGENCY CLEANUP EFFORTS AT FACILITIES LISTED ON THE FEDERAL DOCKET

Agency	Total Docket Facilities	No Further Action Needed[a]	Cleanup Under Way[b]	Cleanup Complete
Department of Agriculture	39	12	1	1
Department of Defense	572	111[c]	51	3
Department of Energy	66	6	20	3
Department of the Interior	263	151	2	15
Department of Transportation	48	24	3	0
Other Agencies	111	71	9	8
Total	1,099	375	86	30

SOURCES: Congressional Budget Office based on conversations and written information from federal agency officials, and agency annual reports to the Congress on hazardous waste activities for fiscal year 1988.

a. As indicated by the agency; the Environmental Protection Agency has not yet determined whether further investigations or cleanup activities will be necessary at most facilities.

b. Includes interim cleanup activities, corrective actions taken under requirements of the Resource Conservation and Recovery Act of 1976, and remedial activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980.

c. The Department of Defense provided no information on the number of its docket facilities where no further action was expected to be needed. The Department of Defense's *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program stated that about 70 percent of DoD sites that were investigated so far required further investigation or cleanup activity. This estimate of 111 facilities represents 30 percent of the 369 DoD docket facilities with completed initial assessments.

Cleanup requirements under CERCLA or RCRA may not cover certain types of hazardous waste problems at some docket facilities. For instance, RCRA does not regulate some hazardous wastes found at inactive landfills and mining sites on public lands managed by the Department of Agriculture and DOI. Most of these sites are unlikely candidates for the NPL. Thus, further action at these and other facilities will depend on state hazardous waste laws, other federal environmental laws, and the agencies themselves--depending on available funds.[3] An EPA official commented that, if agencies such as DOI were appropriated funds for environmental restoration at these facilities, those agencies must follow the cleanup process under CERCLA.

---

[3] Some of the problems at the Department of Energy's Naval Oil Shale Reserves are being addressed under the Clean Air Act, the Wyoming Department of Environmental Quality Air Quality Regulations, and the Toxic Substances Control Act.

Federal Facilities on the National Priorities List. Few facilities on the NPL are currently at the actual cleanup stage; yet, many of these federal facilities that EPA lists as high priority have had some preliminary RD/RA. DOE has initiated limited removal of hazardous waste or related cleanup at 9 of its 16 NPL facilities. USDA indicated that much of the cleanup needed at its Agriculture Research Service laboratory in Washington state is already under way. Cleanup at the Small Business Administration's Cal West Metals Site is also under way. DOI is planning the RD/RA stage at its Crab Orchard National Wildlife Refuge in Illinois and the cleanup stage at its Lee Acres landfill in New Mexico, a DOI site proposed for the NPL.

Most of the cleanup projects initiated or completed at DoD installations on the NPL involve excavating buried waste, tanks, and contaminated soil. Other DoD cleanup activities include removing explosive materials from Army ammunition plants, treating contaminated soil and groundwater, and providing alternative water supplies to affected communities. In many cases, the stricter SARA provisions will require permanent cleanup and treatment, rather than the containment measures that have often been used at DoD sites.

Cleanup at Facilities Not on the Federal Docket

Federal agencies have initiated few cleanup actions for hazardous wastes at their facilities not on the federal docket. About 150 defense facilities have cleanup operations under way or completed, as shown in Table 11. Of these, about one-half represent cleanup actions that have been funded at formerly owned DoD properties, some of which have more than one project under way. Some removal of hazardous wastes and other cleanup actions are under way or finished at 22 non-DoD facilities, primarily DOE facilities. According to estimates, roughly 6,000 of the nondocket facilities will not require actual cleanup.

DOE has completed cleanup at 10 sites in its Formerly Utilized Sites Remedial Action Program. Most of these sites were once used in nuclear activities of the Atomic Energy Commission or in private operations involving radioactive contamination. The Congress assigned these latter sites to DOE for cleanup. DOE has also completed remedial actions for radioactive contamination at five facilities in its Surplus Facilities Management Program. This group of facilities contains sites no longer in use but in need of some radioactive waste management, primarily the decommissioning of facilities contaminated from radioactive activities. Cleanup of radioactive contamination is also an ongoing operation under two other DOE programs that have sites not on the docket. The Residual Nuclear Explosive Sites program includes 10 sites in the Unites States and in the mid-Pacific

TABLE 11. STATUS OF AGENCY CLEANUP EFFORTS AT FACILITIES NOT LISTED ON THE FEDERAL DOCKET

Agency	Nondocket Facilities	Cleanup Under Way	Cleanup Complete
Department of Agriculture	52	4	0
Department of Defense	8,125	105[a]	52[a]
Department of Energy[b]	42	2	15
Department of the Interior	74	1	0
Department of Transportation	53	0	0
Other Agencies	11	0	0
Total	8,357	112	67

SOURCE: Congressional Budget Office based on conversations and written information from federal agency officials.

NOTE: Table includes some facilities currently owned by the agency as well as those formerly owned.

[a] Includes 20 currently owned facilities that have been cleaned up and 63 currently owned facilities at which cleanup actions are under way. Also represents 74 specific cleanup efforts in progress or completed at formerly owned properties of the Department of Defense. Some of these properties involve numerous ongoing cleanup projects.

[b] No cleanup actions will be required at 2 facilities of the Department of Energy, in addition to the 15 sites where remedial actions have been completed.

where nuclear weapons were tested between 1946 and 1973; the Uranium Mill Tailings Remedial Action Project, legislated by the Congress in 1978, authorized remedial actions by DOE at certain inactive uranium processing sites and nearby properties contaminated with byproducts of uranium mining and other radioactive materials.

Estimated Cleanup Schedules at Federal Facilities

At this time, most agencies have not scheduled the major cleanup projects at their hazardous waste sites because they have not completed adequate investigations at their facilities. The actual pace and timing of cleanup activities at federal facilities will depend, to a major degree, on the agency's available budget. Currently, each agency includes funding for environmental compliance and cleanup activities in its annual budget requests. Other options for financing the cleanup of hazardous wastes at federal facilities have been discussed, including the creation of a trust fund for the environmental restoration of DOE nuclear weapons facilities. This mechanism would remove annual funding for environmental cleanup from the budget appropriation process. The availability of the fund's resources, however, would still constrain the timing and scope of cleanup efforts.

While some agencies have planned specific compliance or cleanup activities over the next five years, only DOE has published preliminary estimates of the timeframe necessary on a facility-by-facility basis. These timeframes currently range from one year for some facilities to more than three decades at the most contaminated sites.[4] These estimates do not take into account the constraints on funding, which may delay the proposed cleanup process. In general, DOE has indicated that cleanup activities will take roughly 15 to 30 or more years at most of its NPL facilities. Some DOE facilities may never be completely cleaned up because of the extent of the contamination, the lack of effective technologies, and the location of the facility. In some cases, the costs of total cleanup may be economically unjustified, given trade-

---

[4] Department of Energy, *Environment, Safety, and Health Needs of the U.S. Department of Energy*, vol. 2: Site Summaries (December 1988).

BOX 3
CLEANUP PROGRESS AT THE ROCKY MOUNTAIN ARSENAL

In 1975, the Department of the Army developed a plan for cleaning up its Rocky Mountain Arsenal (RMA) in Colorado, which was contaminated with hazardous wastes. The three cleanup phases would take 17 years and be completed by 1991.[1] In 1983, the Army published a new plan and revised its schedule to take 30 years because of additional contamination problems and changes in the cleanup plan. By 1984, the Army had again changed its plans, outlining a new strategy to clean up the site by the year 2000. Pressure from Members of the Congress as well as from state and local officials accelerated the schedule to clean up RMA, one of the first federal facilities nominated for the National Priorities List in 1984.

Finally, an amendment in the 1986 Military Construction Authorization Act required the Army to complete all cleanup activities at RMA by September 1993. The Army subsequently prepared four cleanup plans, assuming different cleanup methods, durations, and cost estimates. Only one of these plans would complete the cleanup by the Congressionally mandated deadline.[2] The accelerated cleanup plan for RMA cited numerous issues that could delay the cleanup:

- Uncertainties with the technology for incinerating hazardous wastes and the development of new technologies for removing metal contaminants in soils;
- Unrealistic assumptions in costs and time schedules, including favorable weather conditions, minimal equipment failures, and labor availability;
- State permits, environmental statutes, and litigation;
- Insufficient capacity for disposing of hazardous wastes at commercial landfill sites; and
- Insufficient funds appropriated by the Congress.

---

1. Developments at the Rocky Mountain Arsenal are provided in *Environment*, "The Case of the Rocky Mountain Arsenal," by Karen B. Wiley and Steven L. Rhodes, vol. 29, no. 3, April 1987.

2. Environmental Science and Engineering, Inc., "Report on an Accelerated Cleanup Plan for the Contamination at RMA," Draft Final Report (Commerce City, Colorado: Rocky Mountain Arsenal, Program Manager's Office, June 1986).

offs between spending requests for other contaminated facilities and the health risks they pose. The response of the Congress to requests by DOE for large budget appropriations to comply with current hazardous waste requirements may ultimately determine the degree of cleanup.

DoD has not published a schedule of required activities for compliance and cleanup at its numerous installations. A report, prepared in 1988 by The Mitre Corporation on DoD's Installation Restoration Program (the major element of DoD's Defense Environmental Restoration Program), assumed that DoD could complete the required remedial actions at most DoD facilities within 5 to 10 years.[5] Major cleanup projects, such as constructing groundwater treatment systems, could take longer than 20 years. The actual pace of cleanup, again, will depend on the funds the Congress provides to DoD for its Defense Environmental Restoration Program. DoD's progress in cleaning up the Rocky Mountain Arsenal facility is an example of the obstacles that federal facilities face (see Box 3 on page 35).

APPROPRIATIONS AND PROJECTED COSTS FOR FEDERAL HAZARDOUS WASTE ACTIVITIES

The lack of detailed site information and sufficient cleanup experience makes any estimates of future federal spending on hazardous waste activities uncertain. In fact, estimates are certain to change. In fiscal year 1990, the Congress appropriated about $4.2 billion to federal agencies for compliance and cleanup of hazardous wastes. This amount is an increase of almost 30 percent over appropriations for 1989. In addition, the costs of routine operational compliance with hazardous waste laws are included in the operating expense accounts of individual federal facilities and, therefore, not generally reflected in an agency's environmental budget request (see Box 4).

Most agencies expect that their spending requirements for hazardous waste activities will increase in the future. Only limited budget information, however, is available over the next five years. DOE

---

5. The Mitre Corporation, *Estimate of the Cost to Complete the Installation Restoration Program*, for the Department of Defense, Office of the Deputy Assistant Secretary of Defense for the Environment (October 1988).

BOX 4
BUDGET DATA ON AGENCY COMPLIANCE WITH FEDERAL ENVIRONMENTAL LAWS

Executive Order 12088, "Federal Compliance with Pollution Control Standards," requires the administrator of each federal agency to ensure that "sufficient funds for environmental compliance are requested in the agency budget." As part of this process, each agency must submit an annual budget to the Office of Management and Budget (OMB). As defined by OMB Circular A-106 (December 31, 1974), this budget data indicates the funding needed for specific pollution control projects to bring each agency facility into compliance with all federal environmental laws. Agency requests for funding are categorized by expenditures on air, water, solid waste, hazardous waste, toxic substances and pesticides, radiation, drinking water, and noise pollution. For fiscal year 1990, federal agencies requested $1.75 billion for roughly 1,500 specific environmental projects at federal facilities.

The Environmental Protection Agency is supposed to review and rank these submissions from the agencies in each fiscal year for inclusion in the President's annual budget. Projects are ranked by the data submitted on the facility's compliance with relevant environmental regulation and on the pollutant's threat to human health and the environment. The data is limited and inconsistent, however, and does not provide a detailed or complete accounting of federal expenditures for compliance with environmental statutes. Generally, the A-106 budget data represents the capital costs required for environmental compliance projects and often does not include funding needed for site assessments, investigations, and remedial design studies.[1] The A-106 projects planned by federal agencies under the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 totaled only $1.14 billion for fiscal year 1990. This amount reflects less than 30 percent of the $4.20 billion appropriated for hazardous waste activities. The A-106 process is also not well coordinated with the overall budget appropriations requested annually by each federal agency and submitted to the Congress.

---

[1] The Department of Energy's A-106 budget figures for fiscal year 1990, revised in April 1989, include spending for site investigations of hazardous wastes, design efforts for remedial action, and some program requirements for underground storage tanks.

has projected that its environmental compliance, cleanup, and waste management costs over the next five years will average more than $4.2 billion per year, compared with the $2.6 billion the Congress appropriated in 1990. Together, DOE and DoD have indicated that they may need roughly $80 billion to $130 billion over the next 30 years to complete their environmental compliance and cleanup programs. DoD did not include estimates of future costs for compliance with RCRA requirements, which totaled $801 million in fiscal year 1990. The uncertainty of these figures, based on incomplete investigations and limited actual cleanup, ensures that these estimates of future budgetary needs are conservative.

Budget Appropriations for Fiscal Year 1990

The budget appropriations to federal agencies for compliance and cleanup of hazardous wastes were $4.2 billion in fiscal year 1990, compared with about $3.3 billion in fiscal year 1989. Only the DOE budget reflects costs for all environmental activities, including waste management and operational compliance. Other agency budgets reflect primarily hazardous waste investigation and cleanup costs, in addition to compliance costs under RCRA for underground storage tanks (see Box 5). Environmental activities at DOE facilities make up 60 percent of the 1990 budget appropriations of $4.2 billion, as shown in Table 12. The funds appropriated for DOE include all environmental spending, but the bulk reflects DOE spending for hazardous waste activities specifically required under RCRA and CERCLA.

The weapons facilities of DOE require over 80 percent of the $2.6 billion budgeted for DOE's environmental activities in fiscal year 1990. About $400 million is for routine operational compliance; $2.2 billion is for environmental investigation and cleanup, waste management, and corrective actions--primarily to address noncompliance problems under RCRA. The $2.2 billion is actually $200 million less than DOE projected for 1990 in its report, *Environmental Restoration and Waste Management Five-Year Plan*. This same report indicated that the Savannah River Plant in South Carolina will require

BOX 5
THE UNDERGROUND STORAGE TANK PROGRAM

Petroleum and hazardous chemicals in large volumes are kept in underground storage tanks (USTs). Federal agencies own or operate approximately 60,000 USTs. The total number is probably much larger, since several agencies did not report their UST inventories, particularly the Department of Energy. Environmental problems can result from leaks and spills in USTs, which then contaminate the soil and groundwater. The Environmental Protection Agency (EPA) estimates that between 10 percent and 30 percent of the nearly 2 million USTs, both federally and privately owned, are expected to leak. Thus, the 1984 Hazardous and Solid Waste Amendments to the Resource Conservation and Recovery Act of 1976 required EPA to develop a regulatory program for USTs to prevent, detect, and correct leaks and spills and to establish deadlines for complying with these requirements.

Using EPA's rough estimates, potential costs of federal compliance with the requirements of the UST program could reach $2.5 billion over the next three decades. EPA estimates that the total program cost for UST upgrades, investigations, and corrective actions would be roughly $69 billion, with an average cost of almost $41,000 per tank. This average assumes that 1.7 million USTs would be regulated and that the compliance and cleanup actions would take 30 years.[1]

The federal funding needed to meet the requirements of the UST program varies considerably, according to agency estimates of costs on an average-per-tank basis. The Federal Aviation Administration and the Coast Guard estimate costs of roughly $60,000 per UST; the Postal Service projects UST program costs averaging about $71,000 per UST; and the U.S. Department of Agriculture indicates costs of about $13,000 per UST. Given this wide range of cost estimates, the potential federal liabilities of meeting the requirements of the UST program are hard to project accurately.

---

[1] Reported in 40 CFR Parts 280 and 281, *Federal Register*, September 23, 1988.

TABLE 12. BUDGET APPROPRIATIONS FOR HAZARDOUS WASTE CLEANUP AND COMPLIANCE FOR FISCAL YEARS 1989 AND 1990, BY AGENCY (In millions of dollars)

Agency	1989	1990
Department of Agriculture	5	20
Department of Defense[a]	1,155	1,402
Department of Energy[b]	1,985	2,618
Environmental Protection Agency	1	1
Department of the Interior	16	24
Department of Justice	11	28
National Aeronautics and Space Administration	26	30
Postal Service	39	40
Tennessee Valley Authority	0	2
Department of Transportation	52	19
Veterans Administration	5	12
Total	3,295	4,196

SOURCE: Congressional Budget Office based on conversations and written information from federal agency officials.

NOTE: Only figures of the Department of Defense and the Department of Energy include hazardous waste compliance costs required under the Resource Conservation and Recovery Act of 1976; most of the funds appropriated to the other agencies cover mainly investigation and cleanup costs for hazardous waste contamination.

a. Includes $500 million and $601 million for hazardous waste investigations and cleanup in DoD's budget for fiscal years 1989 and 1990, respectively, and $655 million and $801 million for other environmental compliance activities in these years.

b. Includes hazardous waste corrective actions, remedial activities, and waste management costs of $1,657 million in 1989 and $2,218 million in 1990, plus the costs of routine operational compliance of $328 million in 1989 and an estimated $400 million in 1990.

about $550 million in 1990, and the Hanford Reservation will require almost $450 million, not including operational compliance. Environmental projects at two other facilities within this complex may cost more than $100 million each.

Of the $1.4 billion the Congress appropriated to DoD in 1990 for environmental activities, investigations and cleanup projects at DoD installations will cost $601 million, including formerly owned DoD properties. The Congress increased this amount from the $512 million that DoD actually requested for its Defense Environmental Restoration Program. In 1989, DoD officials indicated that expected funding for this program would remain steady at the 1989 level of $500 million over the next five years. For 1991, however, DoD has requested a budget of $817 million. The difference between the total environmental appropriations for DoD and the amount targeted for cleanup within the Defense Environmental Restoration Program primarily reflects other compliance projects, such as conforming DoD installations to RCRA requirements.

The USDA's budget for investigating and cleaning up hazardous wastes has increased significantly, from $5 million in fiscal year 1989 to $20 million in 1990. Initially, USDA had requested about $26 million for 1990; $5.4 million to investigate and clean up mining sites in national forests; $8 million to investigate and clean up other CERCLA sites; $9 million to check and replace or repair underground storage tanks; and $3.2 million for hazardous waste investigations and corrective actions to comply with RCRA.

Of the $24 million that the Congress appropriated to DOI for fiscal year 1990, about $15 million will reimburse EPA for cleaning up two DOI facilities--the Robinson Brick Company site, and the Krejci dump site in the Cuyahoga National Recreation Area. The remaining funds are slated for CERCLA investigations and cleanup projects, primarily on public lands managed by the Bureau of Land Management and at facilities of the Fish and Wildlife Service. DOI does not generate or handle significant quantities of hazardous wastes; therefore, its expenditures for actions under RCRA should be small, excluding the costs incurred at almost 4,000 underground storage tanks. The budgets of individual DOI facilities or regional offices include these costs, as well as some additional costs for investigations and removal of small quantities of hazardous wastes.

Officials at the National Aeronautics and Space Administration say that NASA's 1990 budget appropriations of $30 million for environmental compliance was scaled down from its initial budget request of $54 million. The revised request was primarily the result of federal budget constraints. The $30 million was the minimum able to meet the agency's most pressing environmental needs and to remain in compliance with environmental statutes. NASA has targeted about $12 million specifically for investigations and cleanup of hazardous waste sites at NASA facilities; most of the remainder is needed to meet RCRA requirements.

All of the $40 million budgeted for the Postal Service in 1990 is needed for the agency's underground storage tank program. The Postal Service has established a 10-year program to investigate and, if necessary, replace its more than 5,000 underground storage tanks.

Funding Requests for Fiscal Years 1991 Through 1995

Except for DOE, federal agencies have not yet prepared detailed budgets for hazardous waste activities over the next five years. Nine other agencies have planned limited investigation and cleanup projects over this period. Estimates of federal spending for hazardous waste compliance and cleanup activities between 1991 and 1995 are shown in Table 13. These figures represent only a partial accounting of the total resources that will be needed. Details of these spending estimates for the five-year period follow:

- DoD has not projected funding requirements for hazardous waste activities beyond fiscal year 1991. The figure of $9 billion in Table 13 reflects two components of DoD costs for hazardous waste activities: environmental investigation and cleanup, and other environmental compliance. DoD increased its budget requests for environmental cleanup projects from $500 million to $817 million between 1989 and

TABLE 13. PARTIAL OR FULL FUNDING REQUIREMENTS FOR HAZARDOUS WASTE ACTIVITIES FOR FISCAL YEARS 1991 THROUGH 1995, BY AGENCY (In millions of dollars)

Agency	Fiscal Years 1991-1995
Department of Agriculture[a]	80
Department of Defense[b]	9,000
Department of Energy[c]	21,163
General Services Administration[d]	5
Department of the Interior	302
Department of Justice	27
National Aeronautics and Space Administration	175
Postal Service	200
Tennessee Valley Authority	40
Department of Transportation	260
Total	31,252

SOURCES: The Department of Energy report, *Environmental Restoration and Waste Management Five-Year Plan*, September 1989, and Congressional Budget Office based on conversations and written information from federal agency officials.

a. Reflects remedial actions only where Preliminary Assessment/Site Investigations were completed or under way. Since additional sites of the U.S. Department of Agriculture need to be assessed and are likely to be identified, costs probably will exceed these projections.

b. The Department of Defense has not projected its hazardous waste costs beyond fiscal year 1991. Spending for environmental compliance and cleanup activities from 1991 to 1995 may total roughly $9 billion, based on DoD budget appropriations in recent years.

c. Includes costs for environmental compliance and cleanup, waste management, and waste treatment and minimization research. Also includes the Department of Energy's projections of routine operational compliance costs of about $400 million per year, or $2 billion over the five-year period.

d. Officials of the General Services Administration indicated that the agency will spend roughly $4 million to $6 million over the next five years on its underground storage tank program.

1991. These costs are estimated at $5 billion over the 1991-1995 period. DoD will use these funds to complete preliminary assessments and site investigations at all DoD docket facilities and additional formerly owned sites. DoD will also initiate and continue remedial investigation and feasibility studies at its installations on the NPL, as well as undertake more cleanup projects. DoD increased its budget for other environmental compliance activities from about $650 million in 1989 to $801 million in 1990. These costs are estimated to total $4 billion over the next five years. The costs of DoD's operational compliance are not available.

- DOE has projected spending of about $19.2 billion for environmental activities between 1991 through 1995.[6] This amount includes $0.7 billion for corrective actions under RCRA at active DOE facilities; $6.8 billion for cleanup activities under CERCLA at inactive hazardous waste sites; and $11.7 billion for hazardous and radioactive waste management (treatment, storage, and disposal, as well as waste minimization research and development). In addition, DOE projected average spending of $400 million per year for operational compliance at its facilities.[7] Over the next few years, DOE spending on hazardous waste contamination will focus on investigations; more actual cleanup should be under way by the mid-1990s.

- USDA has projected $80 million for remedial actions from 1991 to 1995 at sites where initial assessments are completed or under way. Many additional hazardous waste sites, primarily in the national forests, may require funding for investigations and cleanup. USDA is just beginning to examine its 110 active landfills in national forests where both solid and hazardous wastes have been found.

---

[6] Department of Energy, *Environmental Restoration and Waste Management Five-Year Plan* (September 1989).

[7] Department of Energy, *Environment, Safety, and Health Needs of the U.S. Department of Energy*, vol. 1 (December 1988).

- DOI has targeted $302 million for completing cleanup at the Robinson Brick Company site and for reimbursing EPA's emergency removal actions at the Krejci dump site.[8] DOI will also need these funds to continue remedial investigations at the Lee Acres Landfill, which has been proposed for the NPL, and to complete site investigations at 80 hazardous waste sites located in the national parks. These funds may be used to clean up eight privately owned Superfund sites where DOI has been named a Potentially Responsible Party.

- The Department of Justice's Bureau of Prisons has estimated about $16 million to investigate and clean up seven federal prisons. The Drug Enforcement Agency within DOJ has requested about $8 million for hazardous waste activities in fiscal year 1991 from the Asset Forfeiture Fund to finance its cleanup activities at illegal drug laboratories.

- NASA has projected funding needs of $30 million to $35 million per year between 1991 and 1995. NASA will undertake cleanup programs at 10 of its 12 facilities listed on the docket but does not expect to begin remedial actions at most of these facilities until the mid-1990s. Consequently, most of these funds are for continuing investigations and small cleanup efforts and not for major cleanup projects. Thus, NASA budgets for environmental activities may increase significantly beyond 1995, if not before.

- The Postal Service has projected $200 million for hazardous waste activities over the next five years. These funds reflect only the repair and possible replacement costs of its underground storage tanks. Agency officials expect no other spending needs for environmental activities.

- The Tennessee Valley Authority has estimated that it will require about $40 million between 1991 and 1995 for environmental activities at its National Fertilizer Development Center in Alabama. About $30 million is targeted for actual cleanup projects beginning in 1993.

---

[8] The Robinson Brick Company site is an example of how cleanup costs may increase over time. In 1987, costs were estimated at about $3 million, compared with current estimates of about $25 million for total cleanup.

- The Department of Transportation has indicated needing about $260 million beyond fiscal year 1990. About $160 million of this is targeted for compliance activities on the underground storage tanks owned by the Federal Aviation Administration. About $90 million is needed for specific remedial action projects at FAA facilities over the next five years. The Coast Guard has requested about $10 million for environmental activities in fiscal year 1991.

Long-Term Hazardous Waste Costs for the Departments of Defense and Energy

Preliminary estimates indicate that DoD may spend up to $17 billion to complete its Defense Environmental Restoration Program. These long-term estimates are summarized in Table 14. The Mitre Corporation published a report on the costs DoD would need to complete the investigation and cleanup for the Installation Restoration Program within DoD's Defense Environmental Restoration Program.[9] To determine program costs, the report summarized its assumptions in the face of limited information and major uncertainties. Although the report focused on DoD, these assumptions apply to the problems of measuring the budgetary implications of federal hazardous waste efforts in general (see Box 6).

DOE may face potential costs of $71 billion to $111 billion for environmental compliance activities. These estimates cover costs for all environmental compliance, investigation, remedial cleanup, waste management, and research. The estimates include $400 million per year (about $9 billion over the 1989-2010 period) for operational com-

---

[9] The Mitre Corporation, *Estimate of the Cost to Complete the Installation Restoration Program*, for the Department of Defense, Office of the Deputy Assistant Secretary of Defense for the Environment (October 1988).

TABLE 14. PROJECTED COSTS OF ENVIRONMENTAL ACTIVITIES FOR THE DEPARTMENT OF DEFENSE AND THE DEPARTMENT OF ENERGY (In billions of dollars)

Agency	Total Baseline Costs	Total High Costs
Department of Defense	10.4	16.8
Installation Restoration Program[a]	9.7	15.1
Rocky Mountain Arsenal	0.7	1.7
Department of Energy[b]	71.3	110.8
Defense Weapons Complex	62.5	100.6
Other	8.8	10.2

SOURCE: Projections from the Department of Defense's Installation Restoration Program as reported in the *Annual Report to Congress for Fiscal Year 1989*, February 1990, for DoD's Defense Environmental Restoration Program; projections for DoD's share of the Rocky Mountain Arsenal cleanup by DoD officials in a telephone conversation on October 17, 1989; cost estimates of the Department of Energy in *Environment, Safety, and Health Needs of the U.S. Department of Energy*, Volumes 1 and 2, December 1988.

a. Reflects only the costs of hazardous waste investigation and cleanup at currently owned and formerly owned DoD installations, not costs of environmental compliance at active facilities. Reflects costs in fiscal year 1989 dollars, inflated from the fiscal year 1987 estimates of $9 billion to $14 billion provided in the DoD annual report. The high estimates are an attempt to quantify some of the uncertainties inherent in the baseline estimates.

b. Includes compliance costs for all DOE facilities with environmental laws and investigation and cleanup costs at all hazardous waste sites; also reflects costs for DOE waste management operations, including research and operational activities, consistent with the DOE Five-Year plan. Excludes costs for safety and health compliance. The high estimates reflect projections based on stricter cleanup standards than might be imposed under existing environmental requirements.

pliance but exclude costs for safety and health activities, which were included in the DOE *Needs Report*.[10]

The potential costs of $35 billion to $63 billion to clean up the contaminated DOE weapons facilities dwarf the expected federal cleanup liabilities that other agencies may incur. The uncertainties behind the DoD cost estimates for environmental requirements also apply to DOE's cost estimates. Furthermore, the extensive radioactive contamination that exists at DOE facilities makes cleanup costs even more difficult to project than at most other federal facilities. Certain

---

[10] For consistency, safety and health-related costs of the Department of Energy were not included in this Congressional Budget Office study because such costs are not available from other federal agencies.

BOX 6
UNCERTAINTIES IN COST ESTIMATES

The number of hazardous waste sites belonging to each federal agency will determine, in part, future federal expenditures for cleaning up hazardous wastes. The Department of Defense presumably has located from 70 percent to 90 percent of its hazardous waste sites; other agencies, particularly the Departments of Agriculture and the Interior, continue to inventory public lands for potential hazardous waste problems. Cost estimates for cleanup, however, are the more crucial and unknown factor.

Only limited cost information and cleanup experience exists on which to base estimates. Contingencies are likely to arise during the construction phase of cleanup projects. Negotiations over the standards for cleanup required under the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 will also delay cleanup projects and increase costs. This effect is particularly true at federal sites on the National Priorities List, where state and local environmental agencies negotiate the timing and scope of cleanup with the federal agencies and the Environmental Protection Agency.

States increasingly assume more active roles in planning, monitoring, and enforcing federal cleanup of hazardous waste sites. This oversight may ultimately increase cleanup costs through delays, disputes, and litigation. Several officials of state environmental agencies have argued that the standards for treatment and cleanup required under state laws are not significantly stricter than the federal CERCLA and RCRA statutes. A state's interpretation of the standards required under federal laws, however, may differ from EPA's. If state agencies are able to enforce stricter interpretations, cleanup costs could increase. The budgetary impacts, however, are difficult to measure.

aspects of future cleanup at weapons plants are unclear, including: the standard of cleanup that will be required; the standard of cleanup that will be funded; and the cleanup technologies that will be needed, many of which have not yet been developed. DOE has also noted that the discovery of more extensive contamination than is already suspected will be a primary reason for increased federal liabilities at hazardous waste sites.[11]

---

[11] The Secretary of Energy has stated that, because research efforts are under way at the Department of Energy and the Environmental Protection Agency to develop more cost-effective technologies for hazardous waste treatment and to minimize the quantity of wastes generated in the future, the current cost estimates may actually overstate potential federal liabilities.

CONCLUSION

Federal agencies face increasing, yet uncertain, liabilities in complying with all federal and state hazardous waste laws. Over the next few years, agencies will complete more investigations at their hazardous waste sites. The cleanup standards required at federal facilities under the RCRA and CERCLA provisions should be more clearly defined. As a result, agencies should develop a much clearer picture of their actual hazardous waste needs and costs.

The budgetary impact of federal hazardous waste activities could be enormous. Given the billions of dollars in future costs for compliance and cleanup of hazardous wastes at federal facilities, the Congress may not provide federal agencies with enough funding to meet current federal and state requirements. Further, the potential for increasingly strict standards for environmental regulations, particularly under the evolving state environmental programs, is quite large.

The Congress will face two critical issues in its efforts to address federal hazardous waste problems. First, comparative assessments of the hazardous waste problems at different federal facilities are difficult for the Congress to make. Yet, the Congress must determine how to allocate scarce federal dollars efficiently so as to provide the greatest benefit to the public welfare. For these responsibilities, the Congress will need more information on which hazardous waste problems at which federal facilities may cause the most severe damage to human health and the environment. DOE and DoD have developed models to identify and rank the severity of the problems at each of their facilities. Still, no efforts are under way to compare the human health risks at a contaminated federal prison, for example, with the risks at an abandoned mining site within a national forest or at an illegal drug laboratory seized by DEA. Before the severity of the different problems of hazardous waste contamination can be ranked, more research is needed to understand and measure the actual health risks attributed to various sources of contamination. This research data would enable the Congress to evaluate the relative benefits of addressing specific hazardous waste compliance and cleanup problems.

FEDERAL AGENCY SUMMARIES

A Supplement to

FEDERAL LIABILITIES UNDER HAZARDOUS WASTE LAWS

May 1990

Congressional Budget Office

NOTES

The FEDERAL AGENCY SUMMARIES reference the following environmental statutes, regulatory standards, and procedures:

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
Docket	Federal Agency Hazardous Waste Compliance Docket
FFA	Federal Facility Agreement
HRS	Hazard Ranking System
NPL	National Priorities List
PA	Preliminary Assessment
PRP	Potentially Responsible Parties
RCRA	Resource Conservation and Recovery Act of 1976
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments and Reauthorization Act of 1986
SI	Site Investigation

CONTENTS

U.S. DEPARTMENT OF AGRICULTURE 1
- Forest Service
- Agricultural Research Service
- Commodity Credit Corporation
- Farmers Home Administration
- Animal and Plant Health Inspection Service

ARMY CORPS OF ENGINEERS 6

CENTRAL INTELLIGENCE AGENCY 7

DEPARTMENT OF COMMERCE 8

DEPARTMENT OF DEFENSE 11

DEPARTMENT OF ENERGY 34
- Defense Weapons Complex Facilities
- Energy Research Office
- Nuclear Energy Office
- Fossil Energy Office
- Power Marketing Administrations
- Naval Reactors Program

ENVIRONMENTAL PROTECTION AGENCY 56

GENERAL SERVICES ADMINISTRATION 58

DEPARTMENT OF HEALTH AND HUMAN SERVICES 60

DEPARTMENT OF THE INTERIOR 61
- Bureau of Land Management
- National Park Service
- Fish and Wildlife Service
- Bureau of Mines
- Bureau of Reclamation
- U.S. Geological Survey

DEPARTMENT OF JUSTICE 69

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION 72

POSTAL SERVICE 74

SMALL BUSINESS ADMINISTRATION 75

TENNESSEE VALLEY AUTHORITY 77

DEPARTMENT OF TRANSPORTATION 79
  Federal Aviation Administration
  Coast Guard
  Federal Railroad Administration

DEPARTMENT OF THE TREASURY 83

VETERANS ADMINISTRATION 84

TABLES

1. Number of Department of Defense Installations and Sites With Potential Hazardous Waste Contamination, By Service 14

2. Sources of Contamination at Department of Defense Installations on the National Priorities List, September 1988 15

3. Number and Status of Sites in the Installation Restoration Program of the Department of Defense, By Service 18

4. Summary of Remedial Activities at Department of Defense Installations in Fiscal Year 1989 19

5. Department of Defense Installations on the National Priorities List 20

6. Department of Defense Installations Proposed for the National Priorities List 22

7. Status of Formerly Used Properties 24

8. Total Costs Projected for the Defense Environmental Restoration Program of the Department of Defense 27

9. Estimates on Costs to Complete the Installation Restoration Program of the Department of Defense 29

10. Summary of Uncertainties and Potential Effects on the Costs of the Installation Restoration Program of the Department of Defense 30

11. Budget Appropriations for the Defense Environmental Restoration Program for Fiscal Years 1989-1991 32

12. Department of Energy Facilities With Environmental Requirements 37

13. Status of Investigations and Cleanup and Projected Cleanup Schedules at Department of Energy Facilities 44

14. Projected Spending for Environmental Activities at the Department of Energy for Fiscal Years 1991-1996 53

15. Projections for Estimated Costs of Environmental Activities at Department of Energy Facilities for Fiscal Years 1991-1995, and Total Lifetime Costs 54

FIGURE

1. Installation Restoration Program Costs for the Department of Defense 28

INTRODUCTION

This supplement to the Congressional Budget Office study, ***Federal Liabilities Under Hazardous Waste Laws***, provides summaries of each federal agency's hazardous waste problems and a status report on each agency's progress in compliance with major federal hazardous waste laws: the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), and the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The basic source of information for these ***Federal Agency Summaries*** was the November 1988 update of the Federal Agency Hazardous Waste Compliance Docket, compiled by the Environmental Protection Agency (EPA). While the docket lists currently owned federal facilities that either handle hazardous wastes or have reported some type of contamination, the docket gives no account of the type or extent of contamination. Also, the docket excludes formerly owned federal facilities and privately owned facilities where federal agencies may incur liabilities for hazardous wastes.

To provide more complete summaries, CBO surveyed officials from each agency for additional information not available in the federal docket on the hazardous waste liabilities facing federal agencies. For the most part, the information on the status of investigation and cleanup efforts at federal agency facilities reflects progress through the first half of 1989. The data outlined for these *Federal Agency Summaries* are:

- Number and types of facilities or sites;
- Status of investigation and cleanup efforts;
- Projected costs and budgetary impact; and
- Major uncertainties.

These agency summaries also include information on federal facilities that are listed on EPA's National Priorities List (NPL), as well as privately owned facilities on the NPL where EPA has named the agency a Potentially Responsible Party (PRP).

U.S. DEPARTMENT OF AGRICULTURE

The Department of Agriculture (USDA) has 39 facilities listed on the November 1988 update of the federal docket. The USDA requested funding in fiscal year 1990 for hazardous materials management under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) or the Resource Conservation and Recovery Act of 1976 (RCRA) at 52 additional properties. One USDA facility is currently on the National Priorities List (NPL). USDA has also incurred cleanup costs at a formerly operated grain storage site that is on the NPL. USDA may face liabilities at eight other privately owned sites on the NPL at which USDA is currently named a Potentially Responsible Party (PRP) and at other formerly operated grain storage sites. Most USDA facilities with hazardous waste contamination are managed by the Forest Service (FS) and the Agriculture Research Service (ARS). Finally, USDA has 2,081 underground storage tanks (USTs) that have to be inspected and monitored for leaks that may involve consequent cleanup.

USDA requested $25.7 million for hazardous materials management in fiscal year 1990 and was appropriated $19.9 million. USDA has identified projects with an estimated cost of about $80 million over the next five years. Two USDA agencies, the FS and the Commodity Credit Corporation (CCC), face significant uncertainty about the number of sites that will be identified and the severity of their problems.

NUMBER AND TYPES OF FACILITIES OR SITES

An ARS lab in Washington state is the USDA facility that is currently on the NPL. The CCC is the former operator of the grain storage site in Waverly, Nebraska, that is currently on the NPL and that USDA has cleaned up as the primary PRP. The FS is responsible for 58 of the 91 facilities that USDA has identified as needing investigation or cleanup of hazardous materials. The ARS manages another 26 facilities that are research laboratories. Five of the facilities are farms foreclosed by the Farmers Home Administration (FmHA). The Animal and Plant Health Inspection Service (APHIS) and the CCC are each responsible for one facility. Of the 2,081 USTs that are regulated by the UST program under RCRA, the FS manages approximately 1,800 and the ARS is responsible for 218.

Forest Service

The FS manages more than 190 million acres of national forests. Most of these lands have been open for mining and, in certain cases, for use as landfills. The land has also been subjected to unauthorized dumping of hazardous materials. The FS has identified 58 facilities with a total of 132 hazardous waste sites as needing investigation or cleanup. Fifteen of these facilities are on the federal docket. At least 25 national forests are not listed on the docket primarily because they encompass landfills where the presence of hazardous wastes has not been confirmed or mining sites where the discarded debris has not been considered hazardous under RCRA. Of the 132 individual hazardous waste sites identified, 69 are abandoned mining sites, 24 are sanitary landfills, and 34 are "other sites"--a category that consists largely of above-ground dumps.

The FS does not yet know the extent of hazardous waste liabilities as its 190 million acres of land have not been intensively surveyed. The FS relies mainly on its own personnel and forest users to identify potential waste problems. So far, the problems identified and the costs of remedial actions have been relatively small on an average per-site basis, but comprehensive efforts to investigate its landfills or mining sites are proceeding slowly.

Abandoned Mining Sites. FS land has always been accessible for the mining of fuel and nonfuel minerals. Mine tailings, the residue separated out in the process of refining ore, are typically disposed onsite in unlined pits. These piles can be potentially hazardous. Hazardous metals, such as lead in crushed form, are more likely to pass into surface and groundwater; tailings are often tainted with chemicals, such as cyanide, which are used to separate the desired ore from the tailings.

Concern over the large volume of mine tailings and recognition of their typically low toxicity led to an amendment to RCRA Section 3001. This amendment specifically exempted mining wastes from regulation as a hazardous waste under RCRA Subtitle C. CERCLA's definition of hazardous substances is much broader than RCRA's and includes provisions that include some types of mining wastes. In addition, CERCLA also allows the Environmental Protection Agency (EPA) to regulate releases of any "pollutant or contaminant" as broadly defined by CERCLA Section 104. Thus, the USDA is responsible for removing or treating mine-tailing piles that are known to be endangering human health or contaminating the environment.

The standards and timetables that will govern the cleanup of mining sites and, thus, the ultimate costs to the FS are more uncertain. The FS is currently requesting funds to examine mining sites, determine the characteristics of the tailings, and implement small remedial actions, such as altering the flow of surface and groundwater away from the tailing piles. In most states, the FS has significant discretion on the timing and scope of the investigation and remedial actions at mining sites. The regulatory environment may require the FS to test and treat the soil and groundwater more extensively, according to the National Contingency Plan, at sites where it is currently planning only small removals. If so, the ultimate program costs could expand considerably.

The Hazard Ranking System (HRS) has been revised with the specific intent of making the system more sensitive to potential damage to the environment. Many FS mines and landfills have previously scored low under the HRS mainly because they are located in remote and unpopulated areas. The revised HRS may significantly increase the number of sites in remote areas that qualify for inclusion on the NPL.

Landfills. As part of its mission to be responsive to the needs of the communities bordering national forests, the FS currently allows certain communities to have landfills on FS lands. The FS has an inventory of 110 active landfills operating in national forests. Although the FS always had a policy to allow only solid waste (RCRA Subtitle D), not hazardous waste (Subtitle C), disposal at these landfills, controlling accepted wastes is very difficult because the FS does not actually operate the landfill. As a result, many landfills contain a mixture of solid and hazardous wastes.

The FS is beginning to examine these landfills to determine the extent of the problem. The FS is using institutional knowledge and site characteristics, such as proximity to industrial areas, as a way of determining which sites to examine first. Investigating all the present and abandoned landfills on FS land may take an extended period of time.

Other Sites. Other hazardous waste sites on FS land include areas that have been used for the application of wood preservatives, sites where unauthorized disposal of hazardous materials have occurred, and three FS laboratories.

Agriculture Research Service

The ARS is the research arm of USDA and has the typical problems with hazardous materials as do other chemical laboratories. Many of the 137 ARS research laboratories located throughout the country have used hazardous chemicals and have produced hazardous wastes. At some of these facilities, wastes were stored or disposed onsite in dry wells, surface impoundments, septic tanks, and so forth.

ARS is responsible for the one currently owned USDA facility that is on the NPL. This facility is an ARS laboratory in Yakima, Washington. ARS is also responsible for 23 of the 39 USDA facilities on the federal docket. Three additional ARS facilities are likely to be added to future docket updates. These facilities were identified during three surveys that ARS conducted over the last two and one-half years.

Other Agency Problems

From the late 1940s to the early 1970s, the CCC leased land and built facilities to store surplus grain. At its peak in the late 1950s, this grain storage program managed approximately 17 percent of the off-farm storage capacity for grain. Carbon tetrachloride in combination with other fumigants had been applied to protect the stored grain. About 2,000 grain storage facilities formerly operated by CCC were located in the EPA region that encompasses the largest part of the grain belt. One of these, the former CCC grain storage site in Nebraska is currently listed on the NPL. The number of such facilities that may have caused soil or groundwater contamination is difficult to determine, particularly because these facilities are no longer operated by the CCC.

The CCC program to clean up these sites is largely reactive--that is, CCC responds to a problem when a state or the EPA determines that a CCC facility may have contributed to an identified contamination problem. Such a reactive stance may be justified given the large number of these sites, the length of time since CCC operated them, and the uncertainty of contamination occurring at any one site. Relying on regulatory authorities to locate contamination problems and potential liability, however, increases the time that USDA will need to initiate any cleanup. This strategy also leaves a great deal of uncertainty about the total liability that the CCC faces.

The FmHA has lent significant capital to farmers, taking their farms as the major source of loan collateral. As a result, the FmHA currently owns an inventory of approximately 5,000 farms acquired through foreclosure. In some cases, the previous owners have disposed of pesticides or other hazardous chemicals on these lands. The FmHA must rectify these problems before these properties can be resold. The FmHA recently conducted a survey of these facilities and has reported to EPA that hazardous waste sites exist on five of these farms. Closer inspection of properties before foreclosure proceedings should prevent the FmHA from incurring further significant liability in the future.

The USDA's Animal and Plant Health Inspection Service has one facility that is listed on the docket. EPA has agreed that the problem at this facility does not merit further investigation.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

Remedial actions at the CCC grain storage site on the NPL have largely been completed. This facility was responsible for contaminating the municipal water supply of a small Nebraska town. CCC has paid more than $3 million to provide an alternative water supply for the town and to construct, operate, and maintain a groundwater and soil contamination treatment facility. The continuing liability from this site comes from the operation and maintenance of this treatment facility and from EPA oversight.

At the ARS laboratory on the NPL, results of groundwater monitoring and soil samples revealed that the contamination problem was less serious than originally believed. The ARS will be petitioning the state and EPA to have the site delisted from the NPL following approximately $500,000 for remedial actions.

USDA has completed a preliminary assessment at all 17 of the facilities listed on the original February 12, 1988, federal docket. Based on these assessments, USDA will begin or continue with remedial action at three facilities in 1990. USDA will also perform a site investigation at nine more facilities by 1990. The remaining five facilities are not expected to require further investigation or remedial action under CERCLA or RCRA.

USDA is planning to conduct preliminary assessments at 15 of the other 22 facilities that were added to the docket in the November 1988 update. USDA is petitioning to have the other seven facilities removed from the docket because either USDA does not own the facility or does not believe that a reportable release has occurred. USDA completed an assessment at one of these sites to help get the site delisted.

USDA requested funds in 1990 for remedial actions at two facilities that were reported to EPA for future docket listing. USDA has also requested funding for investigation or small remedial actions at 80 sites in 24 national forests that are not listed on the docket.

PROJECTED COSTS AND BUDGETARY IMPACT

USDA established a central program in 1987 for the management of hazardous materials. In fiscal year 1988, USDA requested $15 million for this program but was authorized to spend only $2 million. In fiscal year 1989, $20 million was requested by USDA but only $5 million was authorized. USDA requested $25.7 million for this program for fiscal year 1990 and was appropriated about $20 million. The 1990 funding will be distributed as follows: FS - $12.8 million, ARS - $5.8 million, APHIS - $0.4 million, FmHa - $0.4 million, and the Soil Conservation Service - $0.2 million (for replacement of four pesticide storage facilities and for compliance with the UST program). The Food Safety and Inspection Service will receive $0.2 million, and the Office of the General Counsel is budgeted for $.1 million for activities related to hazardous materials.

The initial USDA budget request of $25.7 million for fiscal year 1990 was broken out according to the following activities: $5.4 million for planning and remedial actions at mine sites under CERCLA; $8 million for planning and remedial actions at other sites under CERCLA; $9 million for the UST program under RCRA; and $3.2 million for other planning and remedial actions under RCRA. In addition, the CCC is using its own funding authority to pay the costs of operating the soil and groundwater treatment facility at the NPL site. To date, CCC expenditures have not been included in USDA's central program for hazardous waste management.

USDA has projected estimated costs of roughly $80 million for projects that will require funding over the 1991-1995 period, with costs declining from $30 million in fiscal year 1991 to about $2 million in fiscal year 1995. These estimates, however, do not include costs of remedial actions at sites where initial investigations have not been started. Therefore, the funding needs projected for the next five years are likely to expand as more facility investigations are initiated, particularly since additional hazardous waste problems are likely to be found.

A decline may occur in spending by USDA for its UST program. Costs are projected to decrease from the $9 million originally requested for fiscal year 1990 to about $1.0 million in fiscal year 1994.

MAJOR UNCERTAINTIES

Both the FS and the CCC have yet to define completely the scope of their problems at hazardous waste sites. Given the extent of FS lands that have been mined or used as landfills and the number of CCC former grain storage sites, the problems of both USDA agencies could well extend beyond the contaminated facilities currently identified. In addition, revisions to the National Contingency Plan and the HRS may significantly increase the scope and scale of remedial actions at hazardous waste sites, those of the FS in particular.

ARMY CORPS OF ENGINEERS

The Army Corps of Engineers (ACE) has 17 facilities listed on the November 1988 update of the federal docket. These facilities are civil works projects or facilities built and operated by the ACE, distinct from the 7,118 formerly used Department of Defense (DoD) properties that the ACE is investigating for hazardous waste contamination. ACE is funding the costs for evaluation and oversight at two sites on the federal docket from its budget for civil works projects.

NUMBER AND TYPES OF FACILITIES OR SITES

The ACE builds and maintains civil works projects around the country, such as dams, reservoirs, and other water projects. Many of these projects provide recreational uses for the public. Other ACE docket facilities include field offices and research laboratories. In general, ACE facilities are not associated with defense activities and are not funded out of the DoD budget.

The November 16, 1988, docket update attributed 18 facilities to the ACE. One site, located at Port Heiden, Alaska, is reportedly not an ACE project. One of the docket sites is an ACE property located at Fort Gibson, Oklahoma. Contamination from polychlorinated biphenyls (PCBs) has been found at this property, resulting from commercial operations that were carried out in an adjacent area. The Department of Justice sued the commercial owners for cleanup costs at the site. These owners are currently conducting remedial measures. So far, the ACE has spent $430,000 for investigations and remedial design plans at this site. ACE expects to incur another $50,000 in 1990.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

Of the 17 ACE docket sites, 13 have had preliminary assessments completed. The four remaining ACE facilities were added to the docket update in November 1988. Based on the completed assessments, the ACE expects that no further actions will be required at 11 facilities. Site evaluation is under way at a landfill in Bonneville, Washington. The Fort Gibson property in Oklahoma is being cleaned up by its former owners.

PROJECTED COSTS AND BUDGETARY IMPACT

The ACE does not break out its costs for hazardous waste compliance--either for conducting investigations or for actual cleanups--in its budget request to the Congress. Any compliance activities have been funded out of the ACE's budget for civil works projects. To date, these costs have been relatively minor.

CENTRAL INTELLIGENCE AGENCY

The headquarters for the Central Intelligence Agency (CIA), which is located in Virginia, was listed on the federal docket as a generator of hazardous wastes under the Resource Conservation and Recovery Act of 1976, Section 3010. All hazardous wastes generated onsite are disposed off-site. No problems with hazardous waste sites are known to exist. The six underground storage tanks at the CIA headquarters are believed to be the only ones owned or operated by CIA. The CIA does not expect to incur any costs associated with hazardous waste compliance or cleanup.

DEPARTMENT OF COMMERCE

The Department of Commerce (DOC) has 12 facilities listed on the November 1988 update of the federal docket. According to a 1989 report, five of these should be delisted, and two other DOC facilities should be added to the docket.[1] DOC may be responsible for cleaning up additional properties acquired through foreclosures on DOC loans that were provided by the Economic Development Administration (EDA). The DOC may face considerable liability at these sites. Also, DOC has been named a Potentially Responsible Party (PRP) at three privately owned sites on the National Priorities List (NPL) and may be financially liable for partial cleanup at these and other sites. For instance, DOC may incur cleanup costs at sites operated during World War II by the War Productions Board (WPB)--an agency that later became a part of DOC. DOC is also responsible for more than 300 underground storage tanks (USTs).

In 1988, DOC established the Environmental Compliance Division. No funding for site assessments, investigations, and remedial actions required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) was requested for fiscal year 1990. The Environmental Compliance Division initiated an inventory of all DOC hazardous waste sites in October 1989, using $145,000 in funds provided from other DOC programs. Funding requests for hazardous waste activities for fiscal year 1991 are being prepared by the responsible DOC divisions.

NUMBER AND TYPES OF FACILITIES OR SITES

Through its efforts to promote U.S. commerce, DOC has operated laboratories and testing facilities and has provided direct and guaranteed loans to businesses. Of the seven facilities thought to be properly listed on the November 1988 docket, two are laboratories of the National Oceanic and Atmospheric Administration (NOAA), one is a facility of the Census Bureau, and one is a facility of the National Institute for Standards and Technology. The remaining three are properties acquired through foreclosure on EDA loans. The two DOC facilities identified as sites that should be added to the docket were a NOAA laboratory in Maryland and a nursery (Columbia Gardens) in Washington, where a complaint of numerous hazardous waste problems had been filed by the state.

The docket sites acquired by the EDA through foreclosure action include the Wisconsin Steel Plant in Illinois, which operated for more than 100 years and disposed of hazardous wastes in an unlined, onsite landfill. Another such site with a long history of hazardous waste activities is the Central Foundry in Alabama, which was left with significant problems after the site was improperly closed by the former owners. The remaining EDA docket site is the Robins Footwear Plant in Pennsylvania.

---

[1] The Department of Commerce contracted with the Department of Energy's Argonne National Laboratory to evaluate the DOC's hazardous waste compliance program. This report, *Assessment of Department of Commerce Hazardous Waste Compliance Programs* (March 15, 1989), concluded that five docket sites were improperly attributed to DOC because three were small quantity generators and two are not owned by the DOC. (One of these sites was cleaned up by the DOC and then sold.)

In addition to these EDA docket facilities, EDA and the International Trade Administration have an ownership interest in approximately 120 properties that have either been acquired through foreclosure or are in the process of liquidation. These properties include steel mills, iron foundries, leather tanneries, furniture manufacturers, and other heavy industry sites. Hazardous wastes have been generated and disposed at many of these properties, for which DOC may be at least partially liable for cleanup. Under the Superfund Amendments and Reauthorization Act of 1986 (SARA), federal agencies must clean up any hazardous waste contamination at properties before they are resold or transferred to private ownership.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

DOC has submitted preliminary assessments at only two docket facilities. DOC has only recently begun to check and repair or replace its more than 300 USTs. A plan to address and comply with these requirements is being prepared.

PROJECTED COSTS AND BUDGETARY IMPACT

Preliminary assessments have not been submitted for most of the DOC docket sites, and environmental surveys have not been completed at the numerous DOC sites acquired through foreclosure. Consequently, the potential financial liabilities facing DOC are uncertain. When the survey of known or potential DOC hazardous waste sites is completed (currently scheduled for September 1990), DOC should have a clearer picture of the extent of its hazardous waste requirements and their associated costs. One indication of the consequent costs DOC may incur for hazardous waste activities comes from an initial assessment of the Wisconsin Steel site owned by EDA. Remedial cleanup costs for this site could total more than $50 million.

MAJOR UNCERTAINTIES

DOC may incur additional liabilities for hazardous waste cleanup at two types of sites:

- Industrial sites where the WPB managed production activities during World War II; and
- Sites on the NPL where DOC provided government loan guarantees (DOC may be named a PRP as a lender, even if the sites are not acquired through foreclosure).

In the first type of site, the WPB monitored and sometimes operated a substantial number of industrial properties capable of manufacturing products needed during World War II. One of these sites, Avtex Fibers in Virginia, is currently on the NPL. The current owner is undertaking the remedial actions. The Department of Justice has notified DOC that the owner will likely sue DOC as a PRP to recover the portion of cleanup costs that can be attributed to activities that occurred at this site during World War II. The costs are estimated at $1 million.

In the second type of sites, SARA allows the Environmental Protection Agency (EPA) to name a lending institution as a PRP if the loan provided allowed the owner/operator to maintain activities that resulted in contamination of the site. The ability of EPA to recover costs for hazardous waste activities from creditors will likely revolve around the lenders actual involvement in the operation of the facilities. EDA and the Small Business Administration may be more viable candidates for claims to recover costs than most private lenders because of their joint role as lenders and technical advisors to businesses. For example, DOC is the principal creditor and thus may be named a PRP at the bankrupt Roebling Steel Plant in New Jersey, a site listed on the NPL. EPA is cleaning up this site with Superfund money. Total costs may exceed $200 million.

Argonne Study

The DOC commissioned the Department of Energy's Argonne National Laboratory to assess DOC's hazardous waste activities and indicate the extent of the problems facing DOC. The report is generally critical of DOC's compliance program, particularly in terms of its budget and the commitment of its upper management. The report surveyed the 12 DOC docket facilities as well as 28 other properties owned or operated by DOC. The report suggests that DOC is exposing itself to additional liabilities by:

- Continuing to violate RCRA requirements for storage and disposal of hazardous wastes;
- Delaying compliance with site assessments and remedial actions required under CERCLA that might minimize the spread of contaminants and potential cleanup costs;
- Acquiring properties through foreclosure before thorough inspection for hazardous waste problems; and
- Selling contaminated property to private parties in violation of the deed requirements of CERCLA Section 120 (h).

Furthermore, the report concluded that DOC is violating Executive Order 12088 that requires the Secretary of every federal agency to request sufficient funding for pollution prevention and abatement activities. Given the lack of a sufficient budget for fiscal year 1990, the Argonne report concluded that "it appears that Commerce Department upper management is still not seriously committed to the protection of its workers, the general public, and the environment from exposure to toxic substances and hazardous wastes generated by Commerce activities."

DEPARTMENT OF DEFENSE

In 1984, the Congress established the Defense Environmental Restoration Program (DERP) to consolidate and expand efforts to clean up hazardous wastes at Department of Defense (DoD) facilities. DERP consists of three main budget elements: the Installation Restoration Program (IRP), Other Hazardous Waste (OHW) operations, and Building Demolition and Debris Removal (BD/DR). The purpose of the IRP--by far the largest element of DERP--is to identify, investigate, and clean up contamination from hazardous wastes at DoD installations and at formerly owned or used DoD properties. The OHW funds research to develop and demonstrate technologies that would minimize and clean up the hazardous wastes that DoD generates. The purpose of BD/DR is to demolish and remove unsafe buildings, structures, and hazardous debris at DoD installations and at formerly used properties.

The DERP *Annual Report to Congress for Fiscal Year 1989 (1989 DERP Annual Report)* identifies 1,579 DoD installations in the IRP. Of these, 572 facilities were listed on the November 1988 update of the federal docket.[2] DoD is investigating another 7,118 formerly owned or used properties for hazardous waste contamination. Also, DoD has been named as a Potentially Responsible Party (PRP) at 61 privately owned sites on the National Priorities List (NPL).[3]

As of November 1989, 59 DoD installations were listed on the NPL, and 33 installations were proposed for the NPL. Most of the NPL installations have a large number of individual hazardous waste sites. There are roughly 2,500 individual hazardous waste sites at the 92 DoD facilities on or proposed for the NPL.

The total costs associated with the DERP are estimated at $10.4 billion to $16.8 billion. DoD has estimated the total cost of cleanup activities under the IRP--for DoD installations and formerly owned or used properties--at $9.7 billion to $15.1 billion (in 1989 dollars). This estimate does not include costs to clean up the Rocky Mountain Arsenal (RMA) in Colorado. DoD's share of that cleanup is estimated at about $650 million to $1.7 billion.[4] Costs of the other two elements of DERP--OHW and BD/BR--are also not included in these cleanup estimates. DoD has decreased its funding for OHW operations from about $35 million in fiscal year 1989 to only $5 million in its budget request for fiscal year 1991. DoD has not requested funding for the BD/DR program since fiscal year 1987.

---

[2] The November 1988 docket update attributed 624 federal facilities to the Department of Defense. According to DoD officials, only 572 of these were correctly listed.

[3] This count is based on information provided by the Environmental Protection Agency as of July 1989. At many of these private Superfund sites, more than one federal agency has been named a Potentially Responsible Party.

[4] Estimates for actual cleanup projects at the Rocky Mountain Arsenal range from $750 million to $2 billion, depending on the type of cleanup treatment that will be done. In addition to these cleanup costs, the Department of the Army has spent $150 million to investigate the facility so far and expects to spend another $150 million for further investigation. The cleanup costs are shared by the Army and Shell Chemical Company, which used the site to develop pesticides from 1952 to 1982.

DERP funding does not cover all environmental activities undertaken at DoD installations. DoD projections for the costs to complete DERP do not include some rather significant environmental requirements, such as the disposal of hazardous wastes generated in current defense operations as well as actions to curtail environmental contamination at active DoD facilities. Compliance with these requirements are funded through the operation and maintenance accounts of the different military services. Also, actions taken at active DoD facilities to comply with other federal environmental laws--such as the Resource Conservation and Recovery Act of 1976 (RCRA), the Clean Air Act, and the Clean Water Act--are also not funded through DERP. In fiscal years 1989 and 1990, the Congress appropriated $655 million and $801 million for environmental compliance activities. DoD has not projected total costs associated with these compliance actions beyond the fiscal year 1991 budget request of $703 million.

A great deal of uncertainty is associated with total DERP funding requirements. DoD is adding more installations, such as Reserve Centers, to the program. DoD officials believe that most hazardous waste sites have been identified, especially those that are likely to require significant cleanup. The number of sites that actually require remedial action cannot be determined until further investigations are completed and cleanup programs are under way at DoD installations. The standard required for cleanup is also uncertain and will depend, in part, on state-specific environmental regulations. At NPL facilities, the interagency agreements negotiated between DoD, the Environmental Protection Agency (EPA), and state environmental agencies will specify the process that will determine the level of cleanup and the schedules required. All of these uncertainties may result in actual costs that greatly exceed DoD's current estimates. DoD plans to apply experience gained from the program to develop new estimates for total costs.

DoD was appropriated $500 million for DERP in fiscal year 1989. For fiscal year 1990, DoD requested $517.8 million for DERP to maintain the 1989 funding level in constant dollars. The Congress appropriated $601 million. For fiscal year 1991, DoD has requested $817 million for DERP.

The Defense Appropriations Act provides the funding for DERP, which is managed centrally by the Office of the Secretary of Defense. The Deputy Assistant Secretary of Defense for the Environment provides policy direction and oversight for the program. The DERP is carried out by each of the military services and the Defense Logistics Agency. Each service is responsible for activities at its installations. The Army Corps of Engineers (ACE) is responsible for carrying out the investigation and cleanup operations at formerly owned or used defense properties. Other owners or users of these properties may also be responsible for some or all of the contamination and resulting cleanup.

NUMBER AND TYPES OF FACILITIES OR SITES

There are three major types of properties for which DoD is responsible under the

IRP. These are currently owned and operated sites, formerly owned or operated sites, and non-DoD sites where DoD contributed to a hazardous waste contamination problem.

Currently Owned and Operated Properties

DoD identified 14,401 hazardous waste sites at the 1,579 facilities included in the IRP as of September 30, 1989. The number of installations included in the IRP has been increasing steadily since the program's inception. At the end of fiscal year 1986, there were 3,526 sites identified at 529 DoD installations; by the end of 1987, this number had grown to 5,165 sites at 739 installations. The installations added earlier in the program were the large, industrial facilities with the highest probability for contamination. The installations added later to the IRP are generally smaller and have a lower probability of requiring significant cleanup activities. The additions are expected to level off in the next few years.

Table 1 shows the breakdown of installations and the number of hazardous waste sites by service. The Army has the most installations (1,125), roughly five times the number as the Air Force or the Navy. As reported in the *1989 DERP Annual Report*, the Army had about 8,600 individual waste sites at its installations, the Air Force had almost 3,500, and the Navy had about 2,000. The Defense Logistics Agency had almost 250 sites. As the table suggests, the number of hazardous waste sites on each installation varies widely.

The November 1989 update of the NPL includes 59 DoD facilities; another 33 have been proposed. This number accounts for almost 8 percent of all the facilities on or proposed for the NPL and for about 80 percent of the 114 federal facilities on or proposed for the NPL. As of September 1988, 49 DoD installations were listed on or proposed for the NPL. This number has almost doubled since then.

The majority of DoD facilities listed on the NPL have hazardous wastes that are typical of standard industrial operations. Daily operations--such as vehicle and airplane maintenance, building maintenance, and metalplating--are typical of many DoD installations. The wastes generated in these operations are similar to those at many commercial NPL sites, including heavy metals, solvents, degreasers, fuels, and waste oils. Virtually all DoD installations on the NPL have sites with contaminated groundwater and/or soil. Many have contamination that has migrated or has the potential to migrate beyond the installation.

Table 2, derived from the *DERP Annual Report to Congress for Fiscal Year 1988* (March 1989), characterizes the types of hazardous waste found at the 49 DoD facilities on or proposed for listing on the NPL as of September 30, 1988. At most of these installations, little difference exists between the wastes found at DoD sites and that found at non-DoD sites listed on the NPL. The significant exception to this similarity is the roughly 18 DoD facilities that contain wastes from chemical munitions.

TABLE 1. NUMBER OF DEPARTMENT OF DEFENSE INSTALLATIONS AND SITES WITH POTENTIAL HAZARDOUS WASTE CONTAMINATION, BY SERVICE

Service	Installations	Sites
Army	1,125	8,642
Navy	184	2,031
Air Force	243	3,481
Defense Logistics Agency	27	247
Total	1,579	14,401

SOURCE: Department of Defense, *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program (February 1990).

TABLE 2. SOURCES OF CONTAMINATION AT DEPARTMENT OF DEFENSE INSTALLATIONS ON THE NATIONAL PRIORITIES LIST, SEPTEMBER 1988

Sources of Contamination	Number of Installations
Industrial Operations	27
Land Disposal/Landfill	34
Surface Impoundment/Lagoon	16
Spill Site	16
Fire Training Area	5
Munitions Related Wastes	13
Heavy Metals	37
Petroleum/Oil/Lubricants (and other hydrocarbon fuels)	16
Volatile Organic Compounds	43

SOURCE: Department of Defense, *Annual Report to Congress for Fiscal Year 1988* for DoD's Defense Environmental Restoration Program (March 1989).

NOTE: These sources of hazardous waste contamination reflect the problems found at the 49 DoD installations on or proposed for the National Priorities List as of September 30, 1988. Any one installation may be listed as having more than one type of waste.

Formerly Owned or Operated Properties

There are 7,118 formerly owned DoD properties that the ACE is investigating for potential contamination. These properties have experienced large, costly cleanups of landfills, burial sites, and above-ground gasoline tanks at former arsenals, ammunition plants, and depots; cleanups of smaller underground storage tanks (USTs) and storage yards for transformers and equipment; and cleanup of wastes from the manufacturing of artillery and explosives.

Properties Where the Agency Is a Potentially Responsible Party

At 61 non-DoD facilities on the NPL, DoD is potentially responsible for the cleanup of hazardous wastes resulting from its operations, even though DoD never owned the property. The extent to which DoD is financially liable for cleanup of hazardous waste sites on property that the agency does not own is still largely uncertain. Liability will depend on the role DoD played as a contributor to the contamination.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

DoD has established a three-tiered priority system to address sites on a worst-first basis. In this system, sites that are on or proposed for the NPL or other sites that pose an imminent or substantial risk to the public or the environment are assigned the highest priority. The other categories address problems of lesser concern.

DoD developed a tool called the Defense Priority Model (DPM) to assist in setting priorities for cleanup using data gathered during the remedial investigation (RI) stage of required activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).[5] This DPM assigns each site a numerical score that represents the potential threat to human health and the environment based on the media through which the contaminants pass, the relative concentration and toxicity of the contaminants, and the potential human and ecological exposure to the contaminants.

Although DoD's goal is to establish priority for cleanup of the sites according to the criteria described above, other considerations will likely have an impact in determining cleanup schedules and budgeting. Examples of these considerations include military missions, community and state concerns, regulatory requirements, and overall program efficiencies.

INSTALLATION RESTORATION PROGRAM

In the *1989 DERP Annual Report*, DoD lists the status of cleanup activities according to the number of waste sites at DoD facilities. Table 3 shows the program status at the end of fiscal year 1989. DoD had completed Preliminary Assessments/Site Investigations (PA/SIs) at 13,941 sites (about 97 percent of the 14,401 sites in the IRP); 301 additional PA/SIs are under way. DoD has been identifying and assessing sites since the late 1970s. Based on the PA/SIs that DoD has completed, about 70 percent of the DoD sites need further investigation and probable cleanup.

---

[5] This model does not replace the Environmental Protection Agency's Hazard Ranking System (HRS). The HRS is a screening tool that uses data gathered during the Site Inspection stage under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to determine whether a site warrants inclusion on the National Priorities List. The HRS was not developed nor has it been used by EPA to rank cleanup activity at contaminated sites.

DoD has completed a Remedial Investigation/Feasibility Study (RI/FS) at 1,053 sites and has initiated these studies at another 3,271 sites. In addition, 1,387 sites were scheduled for future RI/FSs. DoD has completed the Remedial Design/Remedial Action (RD/RA) stage at 287 sites and has projects under way at 905 sites. Most of these actions consist of waste removals and other interim steps that address immediate threats to the public and the environment, such as providing alternative water supplies. These interim steps are part of larger, multiyear cleanup efforts. At this time, few remedial actions listed by DoD as completed would be considered final cleanup actions--often, additional permanent remedial actions are required.

Table 4 lists the remedial actions DOD carried out in fiscal year 1989. DoD began or completed 189 remedial actions at 135 installations. (At some installations, more than one type of action was taken.) Most projects involve excavation and removal of buried wastes, storage tanks, and/or contaminated soil. DoD expects its remedial actions to steadily increase over the next few years and peak in the mid-1990s. DoD allocated 52 percent of its 1988 IRP budget to RD/RA projects, up from 29 percent in 1986. Remedial actions are more costly than remedial investigations. As the scope of remedial actions increases, DoD's budgetary requirements for DERP are likely to increase significantly.

Installations on the National Priorities List. Table 5 and Table 6 list the 92 DoD installations on and proposed for the NPL. DoD had initiated RI/FS work at 76 of its 92 NPL facilities as of September 1989. Final RD/RA activities, based on RI/FS recommendations and the terms of signed interagency agreements, had not yet been initiated at any NPL installation. However, DoD started or continued interim remedial actions at 47 NPL facilities. Further, DoD signed 18 additional interagency agreements at NPL facilities in 1989, compared with the 1 signed in 1987. DoD completed its first Record of Decision at the Naval Weapons Station in California. This agreement specified the remedial actions that were selected to clean up this facility and scheduled the cleanup to begin in July 1990.

Formerly Used Properties. The investigations and cleanup procedures at the 7,118 formerly used DoD properties are similar to those at currently owned DoD installations. As shown in Table 7, the ACE has completed PAs at 1,732 properties and has another 1,826 PAs under way. Of the formerly owned properties with completed PAs, the ACE found that about 1,414--or 82 percent--require no further investigation or cleanup. Site investigations (SIs) have been started at 116 of the remaining 318 properties. The ACE has initiated RI/FSs at 35 properties in addition to the 7 already completed.

The ACE has started 74 cleanup projects at formerly owned DoD sites and has completed 32 individual projects. These projects mostly involve cleaning up contamination from USTs or from leaking polychlorinated biphenyl transformers.

TABLE 3. NUMBER AND STATUS OF SITES IN THE INSTALLATION RESTORATION PROGRAM OF THE DEPARTMENT OF DEFENSE, BY SERVICE

Service	Total Instal- lations	Total Sites	Preliminary Assessment/ Site Investigation		Remedial Investigation/ Feasibility Study			Remedial Design/ Remedial Action		
			C	U	C	U	F	C	U	F
Army	1,125	8,642	8,554	39	570	536	530	135	447	128
Navy	184	2,031	1,980	36	10	820	305	28	87	725
Air Force	243	3,481	3,160	226	466	1,782	534	117	368	1,272
Defense Logistics Agency	27	247	247	0	7	133	18	7	3	61
Total	1,579	14,401	13,941	301	1,053	3,271	1,387	287	905	2,186

SOURCE: Department of Defense, *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program (February 1990).

C = Cumulative total sites completed.

U = Number of sites with activity under way.

F = Number of sites scheduled for future investigation or cleanup activities.

TABLE 4. SUMMARY OF REMEDIAL ACTIVITIES AT DEPARTMENT OF DEFENSE INSTALLATIONS IN FISCAL YEAR 1989

Type of Activity	Number of Activities
Alternate Water Supply/Treatment	19
Incineration	4
Site Treatment/Remediation	100
Decontamination	3
Waste Removal	33
Groundwater Treatment	30
Total	189

SOURCE: Department of Defense, *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program (February 1990).

NOTE: These types of remedial activities reflect those undertaken at 135 DoD installations in fiscal year 1989; at some installations, more than one type of activity was undertaken.

TABLE 5. DEPARTMENT OF DEFENSE INSTALLATIONS ON THE NATIONAL PRIORITIES LIST

Installation	State
Air Force Bases	
Castle	California
Dover	Delaware
Eielson	Alaska
Fairchild	Washington
Griffiss	New York
Hill	Utah
March	California
Mather	California
McChord	Washington
McClellan	California
Norton	California
Plattsburgh	New York
Robins	Georgia
Tinker	Oklahoma
Travis	California
Williams	Arizona
Wright-Patterson	Ohio
Air Force Installations (Other)	
Air Force Plant PJKS	Colorado
Otis Air National Guard Base	Massachusetts
Twin Cities Air Force Reserve Base	Minnesota
Army Ammunition Plants	
Alabama	Alabama
Cornhusker	Nebraska
Joliet	Illinois
Lake City	Missouri
Lone Star	Texas
Louisiana	Louisiana
Milan	Tennessee
Army Depots	
Anniston	Alabama
Letterkenny	Pennsylvania
Sacramento	California
Savanna	Illinois
Sharpe	California
Umatilla	Oregon

(Continued)

TABLE 5. (Continued)

Installation	State
Army Forts	
Fort Devens	Massachusetts
Fort Dix	New Jersey
Fort Lewis	Washington
Army Installations (Other)	
Aberdeen Proving Ground	Maryland
Fort Lewis Logistics Center	Washington
Rocky Mountain Arsenal	Colorado
Defense Logistics Agency Installations	
Defense General Supply Center	Virginia
Ogden Defense Depot	Utah
Marine Corps Installations	
Albany Logistics Base	Georgia
Barstow Logistics Base	California
Camp LeJeune Military Reservation	North Carolina
Camp Pendleton Base	California
Naval Air Stations	
Brunswick	Maine
Cecil Field	Florida
Jacksonville	Florida
Moffett	California
Pensacola	Florida
Navy Installations (Other)	
Bangor Naval Submarine Base (Site A)	Washington
Davisville Naval Construction Battalion Center	Rhode Island
Fridley Naval Industrial Reserve Ordnance Plant	Minnesota
Keyport Naval Undersea Warfare Engineering Station	Washington
Lakehurst Naval Air Engineering Center	New Jersey
Newport Naval Education and Training Center	Rhode Island
Sabana Seca Naval Security Group Activity	Puerto Rico
Treasure Island Naval Station	California
Warminster Naval Air Development Center	Pennsylvania

SOURCES: Department of Defense, *Annual Report to Congress for Fiscal Year 1988* for DoD's Defense Environmental Restoration Program (March 1989); and the Environmental Protection Agency, National Priorities List, November 1989.

TABLE 6. DEPARTMENT OF DEFENSE INSTALLATIONS PROPOSED FOR THE NATIONAL PRIORITIES LIST

Installation	State
Air Force Bases	
Edwards	California
Ellsworth	South Dakota
Elmendorf	Alaska
F.E. Warren	Wyoming
George	California
Homestead	Florida
Loring	Maine
Luke	Arizona
Mountain Home	Idaho
Pease	New Hampshire
Air Force Installations (Other)	
Air Force Plant 4	Texas
Army Ammunition Plants	
Iowa	Iowa
Longhorn	Texas
Riverbank	California
Army Depots	
Seneca	New York
Tobyhanna	Pennsylvania
Tooele	Utah
Army Forts	
Fort Devens Sudbury Training Annex	Massachusetts
Fort Ord	California
Fort Riley	Kansas
Fort Wainwright	Alaska

(Continued)

TABLE 6. (Continued)

Installation	State
Army Installations (Other)	
Aberdeen Proving Ground (Edgewood)	Maryland
Picatinny Arsenal	New Jersey
Schofield Barracks	Hawaii
Weldon Springs Training Area	Missouri
Defense Logistics Agency Installations	
Tracy Defense Depot	California
Marine Corps Air Stations	
El Toro	California
Yuma	Arizona
Naval Submarine Bases	
Bangor (Site F)	Washington
New London	Connecticut
Naval Weapons Stations	
Concord	California
Earle	New Jersey
Navy Installations (Other)	
Whidbey Island Naval Air Station	Washington

SOURCES: Department of Defense, *Annual Report to Congress for Fiscal Year 1988* for the DoD's Defense Environmental Restoration Program (March 1989); and the Environmental Protection Agency, National Priorities List, November 1989.

TABLE 7. STATUS OF FORMERLY USED PROPERTIES

Actions Taken	Number of Properties
Properties Identified	7,118
Preliminary Assessment	
Under Way	1,826
Completed	1,732
Site Investigations Under Way	116
Projects Completed or Ongoing	168
Building demolition/debris removal	94
Hazardous waste removal	74

SOURCE: Congressional Budget Office, based on conversation with an official of the Army Corps of Engineers from the Formerly Used Defense Sites Program, March 6, 1990.

Three projects involved the detection and removal of unexploded artillery from former target ranges or impact areas. These projects are urgent because communities have since developed on these properties. Prior to fiscal year 1988, the ACE also completed 94 projects under the BD/DR component of DERP.

Anticipated Cleanup Schedules

According to the cost projections provided in the *1989 DERP Annual Report*, DoD will carry out most of its cleanup efforts in the mid-1990s. By about 2004, DoD expects to have completed most of its DERP activities. This timeframe, however, assumes unconstrained budgetary resources. DoD officials indicated that progress in cleaning up their numerous contaminated sites will depend largely on the appropriations that the Congress provides in future years.

In addition, DoD believes that the regulatory process imposed under CERCLA and under the Superfund Amendments and Reauthorization Act of 1986 (SARA) poses significant delays for environmental cleanup efforts. The sometimes confusing and time-consuming nature of the various statutory requirements and the overlapping authority of the different agencies involved tend to slow progress. According to DoD, these regulatory obstacles may constrain timely cleanup efforts as significantly as do constrained budgetary resources.

The ACE cleanup efforts at formerly used sites are estimated to take about 30 to 35 years to complete if funding continues at current budget levels. A funding schedule prepared by an ACE official indicated the need for budgetary resources over the next five years at roughly five times the amount requested for fiscal years 1990 and 1991. If this higher level were appropriated, the official estimated that the program could be completed in about 15 years.

Status of Interagency Agreements

The first interagency agreement for a DoD facility was signed in 1987 for the Twin Cities Army Ammunition Plant in Minnesota. DoD signed 18 additional Federal Facility Agreements (FFAs) in 1989. In June 1988, model language for an interagency agreement that allows for greater state input was developed and agreed to by EPA, DoD, and three associations representing the interests of the states. This language attempted to resolve the most contentious policy issues between EPA and DoD, such as jurisdiction under RCRA or CERCLA and procedures for dispute resolution. This model is supposed to serve as the basis for site-specific FFAs. The interagency agreements now being developed can be more comprehensive than required under SARA, according to DoD. For example, an agreement may cover activities for non-NPL sites on an installation as well as for NPL site(s). Additionally, the agreements are being developed prior to the stage at which SARA requires that they be initiated.

At the RMA in Colorado, an agreement similar to an FFA has been signed between DoD, EPA, and Shell Oil, but the state of Colorado has refused to sign. Essentially, the state argues that it should maintain its authority to enforce standards on RCRA sites at the RMA. DoD and the Justice Department have argued, however, that since the entire facility is now on the NPL, its cleanup is governed by CERCLA and not RCRA authority; therefore, EPA has primary enforcement authority. The case has been in court for over a year, and the results may help determine the role of state and federal jurisdiction at NPL sites.

PROJECTED COSTS AND BUDGETARY IMPACT

Total DERP cost projections range from $10.4 billion to $16.8 billion, as shown in Table 8. In the *1989 DERP Annual Report*, DoD provided cost estimates for the IRP, excluding the RMA, of $9 billion to $14 billion (in 1987 dollars). These costs were adjusted to $9.7 billion to $15.1 billion in 1989 dollars, using the implicit price deflator for the gross national product. The RMA cleanup, however, is the most extensive single cleanup project that DoD faces. The Army's estimate of its share of the costs at this installation range from about $650 million to $1.7 billion.

Figure 1 shows annual projections of costs for the IRP that total $9 billion to $14 billion, as estimated in the *1989 DERP Annual Report*. DoD projects annual requirements for DERP to increase to more than $1 billion during the mid-1990s, as the program develops from largely investigations to the more costly remedial actions. A DoD official indicated, however, that several factors--such as increased competition among companies that clean up hazardous waste or more efficient and economic cleanup technologies--may reduce costs over time. Over the next five years, DoD costs for DERP are estimated to reach roughly $5 billion, based on recent appropriations and the 1991 budget request. DoD projected that costs would rapidly decrease as remedial actions were completed. Most costs remaining after 2004--about $200 million per year--were for anticipated long-term monitoring of certain sites.

The Mitre Corporation Report

The DERP cost estimates are primarily based on a report that The Mitre Corporation completed for DoD in October 1988.[6] Table 9 shows the baseline and adjusted estimates that The Mitre Corporation developed, by service. Of the $8.5 billion to $12.8 billion estimated, $1.5 billion is expected to be needed for cleaning up privately owned NPL sites at which DoD is a PRP.

The Mitre Corporation's adjusted estimate of $12.8 billion attempted to account for some of the uncertainties facing the IRP by estimating their potential effects on total costs. The major uncertainties are the growth in the number of sites and the growth in the costs of undertaking the actual cleanup. Other uncertainties that The Mitre Corporation considered are the changing regulatory requirements, program pace, inflation, market factors, and PRP liabilities. Table 10 summarizes the sources of these uncertainties and the estimates of their effects.

The program management staff from the individual armed services provided

---

[6] The Mitre Corporation, *Estimate of the Cost to Complete the Installation Restoration Program*, for the Department of Defense, the Office of the Deputy Assistant Secretary of Defense for the Environment (October 1988).

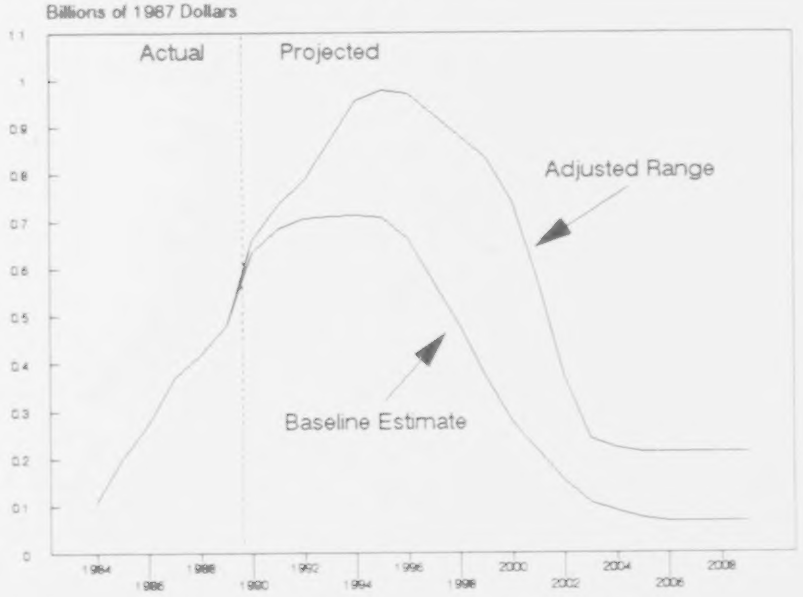
TABLE 8. TOTAL COSTS PROJECTED FOR THE DEFENSE ENVIRONMENTAL RESTORATION PROGRAM OF THE DEPARTMENT OF DEFENSE (In billions of dollars, fiscal year 1989)

Program Component	Range of Costs		
Installation Restoration Program[a]	9.7	--	15.1
Rocky Mountain Arsenal[a]	0.7	--	1.7
Total	$10.4	--	$16.8

SOURCE: Department of Defense, *Annual Report to Congress for Fiscal Year 1989* for DoD's Defense Environmental Restoration Program (February 1990), and projections from DoD officials from the Rocky Mountain Arsenal.

a. Cleanup of the RMA will be funded through the Installation Restoration Program budget, but the DoD projections for the IRP exclude the RMA cleanup estimates.

Figure 1.
Installation Restoration Program Costs for the Department of Defense



SOURCE: Department of Defense, *Annual Report to the Congress for Fiscal Year 1988* for the Defense Environmental Restoration Program, March 1989.

NOTE: These costs do not include Other Hazardous Waste operations or Building Demolition/Debris Removal activities. They also exclude costs of remedial activities at the Rocky Mountain Arsenal in Colorado.

TABLE 9. ESTIMATES ON COSTS TO COMPLETE THE INSTALLATION RESTORATION PROGRAM OF THE DEPARTMENT OF DEFENSE (In billions of dollars, fiscal year 1987)

Program Component	Baseline	Adjusted
Army[a]	3.2	4.8
Navy	1.9	3.0
Air Force	2.0	3.1
Defense Logistics Agency	0.2	0.3
Formerly Used Sites	1.2	1.6
Total	8.5	12.8

SOURCE: The Mitre Corporation, *Estimate of the Cost to Complete the Installation Restoration Program*, October 1988.

NOTE: The adjusted estimate accounts for some of the uncertainties facing the program and represents their potential effects on total costs.

a. The Army estimate excludes the costs of about $650 million to $1.65 billion associated with the Rocky Mountain Arsenal.

TABLE 10. SUMMARY OF UNCERTAINTIES AND POTENTIAL EFFECTS ON THE COSTS OF THE INSTALLATION RESTORATION PROGRAM OF THE DEPARTMENT OF DEFENSE

Source of Uncertainty	Potential Effect
Number of Sites	Growth of 10 percent to 30 percent in estimates of individual services
Construction Contingencies	Increase of 25 percent in remedial action costs
Effects of Superfund Amendments and Reauthorization Act	Increase of 30 percent in remedial action costs
Changing Regulations Affecting Cleanup Requirements	No assessment of effect
Program Pace, Expenditure Rates	No assessment of effect
Inflation	No assessment of effect
Liability as Potentially Responsible Party	No assessment of effect beyond estimates provided by the DoD services

SOURCE: The Mitre Corporation, *Estimate of the Cost to Complete the Installation Restoration Program*, October 1988.

estimates of growth in the potential number of sites--from 10 percent to 30 percent--based on the PAs and on the more detailed SIs that had been completed at DoD installations. The two principal sources of uncertainty in the costs for remedial action are contingent on the costs of construction and the negotiation of standards or requirements for cleanup at specific sites. The estimates for higher construction costs attempt to make allowances for unexpected problems that may occur during construction. In many cases, the full extent of the problem may not be known until construction is under way and the site's quantitative characteristics (actual size, nature, type, and extent of the contamination) are determined. *The Mitre Report* multiplied the estimated costs of remedial actions by 25 percent to account for the uncertainties in construction costs, which is typical of large, long-term construction projects.

The Mitre Report also multiplied the costs for remedial actions by 30 percent to account for the uncertainties involved in negotiations under SARA. Under SARA, DoD must negotiate an interagency agreement with the appropriate EPA region, the state, and the locality on the final cleanup action for each NPL site. DoD may also be required to follow essentially the same negotiation process for its non-NPL sites. A prolonged negotiation process has the potential to increase program costs significantly through schedule delays and potential litigation.

Defense Environmental Restoration Program

The Congress appropriated $500 million in fiscal year 1989 for DERP, as shown in Table 11. DoD originally requested $517.8 million and $519.9 million for fiscal years 1990 and 1991, respectively, thereby providing for constant program funding in 1990 and for a 2.5 percent real decline in 1991. The Congress appropriated $601.1 million to DERP in fiscal year 1990; subsequently, DoD increased its budget request for DERP in fiscal year 1991 to $817 million.

Of the total DERP appropriations of $500 million in fiscal year 1989, $466.6 million, or 93 percent, was for IRP. For fiscal year 1990, the IRP portion accounts for 98 percent of the $601.1 million appropriations for DERP. The IRP's share of total DERP funding increased from 57 percent in 1984, the first year of the program, to 89 percent by 1987.

DoD has requested the greatest portion of its 1991 DERP funding for environmental restoration at Army facilities. The Army and the Air Force account for about 75 percent of the DERP budget. Funding for formerly used DoD sites was $67 million in 1990; DoD has increased that amount by more than 40 percent--to $96.5 million--in its budget request for fiscal year 1991.

Other Hazardous Waste. The OHW operations received $33.6 million in 1989--about 7 percent of total DERP funds--to find cost-effective approaches to DoD's waste management activities that would also generate less waste. OHW funding estimates of growth in the potential number of sites--from 10 percent to 30 percent--based on the PAs and on the more detailed SIs that had been completed at DoD installations. The two principal sources of uncertainty in the costs for remedial action are contingent on the costs of construction and the negotiation of standards or requirements for cleanup at specific sites. The estimates for higher construction costs attempt to make allowances for unexpected problems that may occur during construction. In many cases, the full extent of the problem may not be known until construction is under way and the site's quantitative characteristics (actual size, nature, type, and extent of the contamination) are determined. *The Mitre Report* multiplied the estimated costs of remedial actions by 25 percent to account for the uncertainties in construction costs, which is typical of large, long-term construction projects.

The Mitre Report also multiplied the costs for remedial actions by 30 percent to account for the uncertainties involved in negotiations under SARA. Under SARA, DoD must negotiate an interagency agreement with the appropriate EPA region, the state, and the locality on the final cleanup action for each NPL site. DoD may also be required to follow essentially the same negotiation process for its non-NPL sites. A prolonged negotiation process has the potential to increase program costs significantly through schedule delays and potential litigation.

Defense Environmental Restoration Program

The Congress appropriated $500 million in fiscal year 1989 for DERP, as shown in Table 11. DoD originally requested $517.8 million and $519.9 million for fiscal years 1990 and 1991, respectively, thereby providing for constant program funding in 1990 and for a 2.5 percent real decline in 1991. The Congress appropriated $601.1 million to DERP in fiscal year 1990; subsequently, DoD increased its budget request for DERP in fiscal year 1991 to $817 million.

Of the total DERP appropriations of $500 million in fiscal year 1989, $466.6 million, or 93 percent, was for IRP. For fiscal year 1990, the IRP portion accounts for 98 percent of the $601.1 million appropriations for DERP. The IRP's share of total DERP funding increased from 57 percent in 1984, the first year of the program, to 89 percent by 1987.

DoD has requested the greatest portion of its 1991 DERP funding for environmental restoration at Army facilities. The Army and the Air Force account for about 75 percent of the DERP budget. Funding for formerly used DoD sites was $67 million in 1990; DoD has increased that amount by more than 40 percent--to $96.5 million--in its budget request for fiscal year 1991.

Other Hazardous Waste. The OHW operations received $33.6 million in 1989--about 7 percent of total DERP funds--to find cost-effective approaches to DoD's waste management activities that would also generate less waste. OHW funding

TABLE 11. BUDGET APPROPRIATIONS FOR THE DEFENSE ENVIRONMENTAL RESTORATION PROGRAM FOR FISCAL YEARS 1989-1991 (In millions of dollars)

Service or Program Component	1989	1990	1991
Army	241.9	264.3	326.3
Navy	68.7	157.5	185.6
Air Force	172.8	167.4	287.7
Defense Logistics Agency	16.8	11.9	17.4
Total	500.2	601.1	817.0
Installation Restoration Program	466.6	570.6	792.4
Other Hazardous Waste Operations	33.6	30.5[a]	24.6[a]
Total	500.2	601.1	817.0

SOURCE: Congressional Budget Office, based on a telephone conversation with a budget official in the Defense Environmental Restoration Program, April 4, 1990.

[a] The Department of Defense official explained that, in fiscal years 1990 and 1991, only $10.5 million and $4.6 million are needed for actual Other Hazardous Waste operations. The remainder is needed for DoD efforts to get state and local governments and other interested parties more involved in the cleanup programs at DoD installations.

decreased significantly in 1990 to only $10.5 million.[7] For fiscal year 1991, DoD has requested only $4.6 million for OHW activities. DoD decided to reallocate most of the funds from OHW operations for 1990 and 1991 to remedial investigations and cleanup actions in the IRP.

Building Demolition/Debris Removal. The BD/DR element of the DERP has not received funds since 1988, nor is DoD planning to request funds for BD/DR through 1991. Higher priority cleanup activities are the reason that BD/DR funds have not been requested.

---

[7] The Department of Defense actually budgeted $30.5 million for the Other Hazardous Waste operations in 1990. Only $10.5 million is needed for waste research activities carried out under this program; the remaining $20 million is targeted for DoD efforts to involve state and local governments and interested parties in the cleanup programs at DoD installations. DoD indicated that these activities are part of the Installation Restoration Program but that funding was included in the OHW account to identify these costs separately.

DEPARTMENT OF ENERGY

The Department of Energy (DOE) has issued various reports in recent years on the scope of activities at its facilities and the potential costs of compliance with federal and state environmental statutes and DOE policies.[8] Many facilities in DOE's Defense Weapons Complex (DWC) have extensive radioactive and other hazardous waste contamination as a result of DOE efforts to develop and manufacture nuclear weapons over the past 30 years. This contamination is expected to take billions of federal dollars to clean up over the next 30 years. DOE has identified various types of environmental compliance and cleanup activities that may be required at the 108 facilities that DOE either owns or is responsible for cleaning up.[9] Currently, 16 of these facilities are on the National Priorities List (NPL).

DOE has estimated costs between $71 billion and $111 billion to: (1) carry out routine or "base" operational compliance with current environmental statutes; (2) undertake specific corrective actions at active DOE facilities to meet the requirements of the Resource Conservation and Recovery Act of 1976 (RCRA); (3) clean up contamination resulting from past operations, including decontaminating and decommissioning (D&D) inactive DOE nuclear facilities; and (4) carry out radioactive and other hazardous waste management (including research to develop and improve waste-handling and cleanup technologies).[10]

DOE's budget appropriations for environmental activities for fiscal year 1990 are $2.6 billion, of which about $400 million is for routine operational compliance. Over the 1991-1995 period, according to DOE's *Environmental Restoration and Waste Management Five-Year Plan* (the *Five-Year Plan*), DOE estimated needing more than $19 billion for environmental activities. This estimate does not include about $2 billion that DOE expects to spend on routine compliance at its currently operating facilities, according to DOE's *Environment, Safety, and Health Needs of the U.S. Department of Energy* (the *Needs Report*).

---

[8] Department of Energy, *Environmental Restoration and Waste Management Five-Year Plan* (September 1989); *Environment, Safety, and Health Needs of the U.S. Department of Energy*, Vol. 1: Assessment of Needs (December 1988), and Vol. 2: Site Summaries (December 1988); *United States Department of Energy Nuclear Weapons Complex Modernization Report* (December 1988); and *Annual Report to Congress for Fiscal Year 1988* under the Comprehensive Environmental Response, Compensation and Liability Act (December 1988).

[9] In certain cases, the Department of Energy has classified a set of similar sites not in the same location as a single "facility." These facility listings include the Residual Nuclear Explosive Sites, the Uranium Mill Tailings Remedial Action Project, and the Grand Junction Remedial Action Project.

[10] These figures are based on the costs of the Department of Energy's environmental program reflected in the *Needs Report* and exclude all costs associated with safety and health-related activities.

The potential costs of DOE's environmental program--particularly cleanup costs for past contamination--are uncertain for several reasons. First, the scope of the contamination problem is not yet fully known. Investigations are still under way at most DOE facilities. In the *Five-Year Plan*, DOE asserts that "more than three-fourths of DOE's environmental problems at inactive sites are in the earliest phases of assessment and investigation."

Second, the capital costs of required cleanup or compliance actions are difficult to project. Current statutory requirements overlap between RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). In some cases, exactly which cleanup standards will have to be met is unclear. Also, potential changes in current federal and state environmental laws may increase the scope of compliance and the costs of cleanup. Future agreements between DOE, the Environmental Protection Agency (EPA), and state environmental agencies will specify the extent and the schedules of cleanup required at all NPL sites. Higher costs than those projected may result. The timing of many cleanup projects is also unknown. Future liabilities associated with these hazardous waste activities will depend to some extent on when these actions occur. Generally, costs tend to rise over time because of inflationary pressures.

Third, DOE has projected D&D costs only for currently inactive facilities. Numerous DOE facilities will be shut down in future years, requiring large and as yet undetermined D&D costs. Plans to move certain DWC activities to new or different locations are outlined in DOE's *United States Department of Energy Nuclear Weapons Complex Modernization Report* (the *Modernization Report*). The costs of closing down facilities that will no longer be needed are not taken into account in cost estimates for DOE environmental programs. While future D&D costs are difficult to estimate, they probably will be significant.

Alternatively, DOE and EPA have various research efforts under way that may reduce these costs. Research to develop and improve technologies for hazardous waste management include efforts to minimize the amount of future wastes that are generated. This research may also reduce costs for cleanup and disposal. Most of these research projects are still in the early stages of development. Until research applications have been demonstrated, their effect on specific cleanup requirements at DOE facilities is not yet clear, nor are their costs.

The most serious hazardous waste contamination exists at the DWC, a group of 20 facilities where U.S. nuclear weapons are designed, produced, and tested. Many of these DWC facilities have contaminated soil and groundwater with large quantities of radioactive and other hazardous wastes, some of which have spread off-site. DOE's preliminary estimate for cleanup costs at the DWC is $35 billion to $63 billion. DOE estimates total costs for environmental activities at the DWC at $62 billion to $101 billion. This estimate represents about 90 percent of total costs for DOE-wide environmental programs.

In 1989, the Secretary of Energy established a new Office of Environmental Restoration and Waste Management. This office was to consolidate the plans and priorities for environmental compliance, cleanup, and waste management at currently inactive DOE facilities. The Congress established the Defense Nuclear Facilities Safety Board in 1988 (P.L. 100-456) to provide external review of DOE safety operations at the DWC. At a Senate Budget Committee hearing in March 1989, the possibility of assigning responsibility for cleaning up the DWC to an outside party was suggested because of the pervasive contamination that DOE has allowed to exist at these facilities. A bill (H.R. 765) was passed by the House Energy and Commerce Committee on April 11, 1989, which would establish an 11-member review commission. This commission would recommend appropriate cleanup programs and funding alternatives for the hazardous waste problems at the DWC.

NUMBER AND TYPES OF FACILITIES OR SITES

The inventory of 108 DOE facilities represented in the Congressional Budget Office (CBO) study, *Federal Liabilities Under Hazardous Waste Laws*, includes the 66 DOE facilities listed on the federal docket and the additional facilities that DOE identified as requiring some type of environmental activity.[11] In addition to DWC facilities, the other facilities requiring environmental activities are primarily research laboratories, energy plants, petroleum reserves, and five special remedial action projects. Currently, 16 DOE facilities are listed on the NPL, and 1 separate site has been proposed for the NPL. In addition to these 108 facilities, DOE has been named a Potentially Responsible Party (PRP) at 6 privately owned NPL sites.

The 20 facilities that make up the DWC are part of DOE's Defense Programs Office. The actual management of these facilities is carried out by the offices for regional operations. The remaining facilities are divided among 6 DOE program offices: 13 facilities within the Energy Research Office, 46 facilities within the Nuclear Energy Office (this includes the 5 special remedial action projects with 42 hazardous waste sites), 1 facility within the Conservation and Renewable Energy Office, 10 facilities within the Fossil Energy Office, 14 facilities within the Power Marketing Administrations, and 4 facilities within the Office of Naval Reactors (see Table 12).

Defense Weapons Complex Facilities

The DWC has been operating for 30 to 40 years. The major liabilities that DOE will incur from DWC operations result from large amounts of radioactive and other hazardous wastes that have been generated and stored at these facilities. The standard industrial practices that were used at the time are not adequate to meet current environmental standards. Nine of these DWC facilities are currently on the NPL; one DWC facility, the Lawrence Livermore National Laboratory Site 300 in California, is proposed for the NPL.

The groundwater at most of these facilities is contaminated to some degree by radioactive or hazardous wastes. At least six installation have onsite levels of groundwater contamination that are hundreds, or sometimes thousands, of times greater than drinking water standards. Contaminated groundwater has also migrated off-site at some locations. Up to 3,000 inactive hazardous waste sites exist at these facilities. Insufficient capital expenditures to maintain and upgrade these aging

---

[11] The November 16, 1988, docket update attributes 67 facilities to the Department of Energy, but 1 of these is not a DOE facility.

TABLE 12. DEPARTMENT OF ENERGY FACILITIES WITH ENVIRONMENTAL REQUIREMENTS

Facility	State
Defense Programs Office	
Feed Materials Production Center*	Ohio
Hanford Reservation*[a]	Washington
Idaho National Engineering Laboratory*	Idaho
Kansas City Plant	Missouri
Lawrence Livermore National Laboratory*	California
Site 300*[b]	
Los Alamos National Laboratory	New Mexico
Mound Plant*	Ohio
Nevada Text Site	Nevada
Oak Ridge Gaseous Diffusion Plant*	Tennessee
Pantex Plant	Texas
Pinellas Plant	Florida
Residual Nuclear Explosive Sites	Nevada
Rocky Flats Plant*	Colorado
Sandia National Laboratories-Albuquerque	New Mexico
Tonopah Test Range	Nevada
Kauai Test Facility	Hawaii
Sandia National Laboratories-Livermore	California
Savannah River Plant*	South Carolina
Waste Isolation Pilot Plant	New Mexico
Y-12 Plant*	Tennessee
Energy Research Office	
Ames Laboratory	Iowa
Argonne National Laboratory-East	Illinois
New Brunswick Laboratory	New Jersey
Brookhaven National Laboratory*	New York
Continuous Electron Beam Accelerator Facility	Virginia
Fermi National Accelerator Laboratory	Illinois
Inhalation Toxicology Research Institute	New Mexico
Laboratory for Energy-Related Health Research	California
Lawrence Berkeley Laboratory	California
Oak Ridge Associated Universities	Tennessee
Oak Ridge National Laboratory*	Tennessee
Princeton Plasma Physics Laboratory	New Jersey
Stanford Linear Accelerator Center	California

(Continued)

TABLE 12. (Continued)

Facility	State
Nuclear Energy Office	
Argonne National Laboratory-West	Idaho
Formerly Utilized Sites Remedial Action Program	
Maywood Chemical Company[a]	New Jersey
W.R. Grace-Wayne Site[a]	New Jersey
Colonie	New York
Niagara Falls	New York
Ashland Oil No. 1	New York
Ashland Oil No. 2	New York
Linde Air Products	New York
Mallinckrodt	Missouri
Acid/Pueblo Canyon	New Mexico
Albany Research Center	Oregon
Bayo Canyon	New Mexico
Chupadera Mesa	New Mexico
Dupont & Company	New Jersey
General Motors	Michigan
Hazelwood	Missouri
Kellex/Pierpont	New Jersey
Middlesex Landfill	New Jersey
Middlesex Sampling Plant	New Jersey
National Guard Armory	Illinois
Palos Park Forest Preserve	Illinois
Seaway Industrial Park	New York
Seymor Specialty Wire	Connecticut
Shpack Landfill	Massachusetts
St. Louis Airport Storage Site[c]	Missouri
St. Louis Airport Vicinity Properties	Missouri
Universal Cyclops	Pennsylvania
University of California	California
University of Chicago	Illinois
Ventron	Massachusetts
Paducah Gaseous Diffusison Plant	Kentucky
Portsmouth Gaseous Diffusion Plant	Ohio
Energy Technology Engineering Center (Santa Susana Field Laboratory	California

(Continued)

TABLE 12. (Continued)

Facility	State
Surplus Facilities Management Program	
Weldon Spring Site[e]	Missouri
Monticello Remedial Action[e]	Utah
Center for Energy and Energy Research	Puerto Rico
Niagara Falls Storage Site	New York
Laboratory for Energy-Related Health Research[d]	California
Santa Susana Field Laboratory[d]	California
Idaho National Engineering Laboratory[d]	Idaho
Argonne National Laboratory[d]	Illinois
Piqua Nuclear Power Station	Nebraska
Nevada Test Site[d]	Nevada
Los Alamos Laboratory[d]	New Mexico
Battelle Columbus Laboratory	Ohio
Hallam Nuclear Power Station	Ohio
Mound Plant[d]	Ohio
Plutonium Fuel Fabrication Facility	Pennsylvania
Shippingport Station	Pennsylvania
Boiling Nuclear Superheater Power Station	Puerto Rico
Savannah River Plant[d]	South Carolina
Oak Ridge National Laboratory[d]	Tennessee
Hanford Reservation[d]	Washington
Uranium Mill Tailings Remedial Action Project	
Grand Junction Project	Colorado
West Valley Demonstration Project	New York
Conservation and Renewable Energy Office	
Solar Energy Research Institute	Colorado
Fossil Energy Office	
Component Development and Integration Facility	Montana
Morgantown Energy Technology Center	West Virginia
National Institute for Petroleum Research	Oklahoma
Naval Petroleum Reserve No. 3	Wyoming
Naval Oil Shale Reserves No. 1, 2, and 3	Connecticut, Utah
Naval Petroleum Reserve-California	California
Pittsburgh Energy Technology Center	Pennsylvania
Strategic Petroleum Reserve	Louisiana, Texas
Weeks Island Reserve	Louisiana
Big Hill Reserve	Texas
Great Plains Coal Gasification Plant	North Dakota

(Continued)

TABLE 12. (Continued)

Facility	State
Power Marketing Administrations	
Bonneville Power Administration	Oregon
Burley Maintenance Headquarters	Idaho
Troutdale	Oregon
Alvey	Oregon
Snohomish	Washington
Olympia	Washington
Bell	Washington
Custer	Washington
Columbia	Washington
Midway	Washington
Ross*	Washington
Covington	Washington
Western Area Power Administration	Colorado
Power Operations	Colorado
Hinton Hazardous Waste	Iowa
Watertown	South Dakota
Naval Reactors Program	
Knolls Atomic Laboratory-Windsor	Connecticut
Knolls-Kesselring	New York
Knolls-Knolls	New York
Bettis Atomic Laboratory	Pennsylvania

SOURCES: Environmental Protection Agency, the *Federal Agency Hazardous Waste Compliance Docket* (November 16, 1988); Department of Energy, *Environment Safety and Health Needs of the U.S. Department of Energy* (the *Needs Report*), Volume 2 (December 1988).

* Denotes a facility on the National Priorities List as of November 1989.

a. There are four separate Hanford sites listed on the NPL.

b. This site is proposed for the NPL.

c. The St. Louis Airport Storage Site is a privately owned facility on the NPL. DOE is named a Potentially Responsible Party at this site, which is included in DOE's Formerly Utilized Sites Program although DOE never owned the site.

d. These 10 facilities in the Surplus Facilities Management Program are inactive sites associated with other DOE facilities included in the inventory. They are not included among the 108 DOE facilities.

facilities with current environmental standards have allowed significant environmental, safety, and health-related problems to develop. All three existing nuclear reactors for nuclear materials production (primarily plutonium), located at the Savannah River Plant and the Hanford Reservation, are shut down due to safety violations and necessary improvements.

Other Facilities of the Department of Defense

Generally, the hazardous waste problems that are found at those DOE facilities not associated with the nuclear weapons program are less serious than those at the DWC. Most of the contamination exists at the many DOE laboratories. More than 40 facilities represent inactive hazardous waste sites that were once used by DOE or for which the Congress has given DOE responsibility for cleaning up. Several DOE facilities that do not have environmental problems were listed on the federal docket or identified by DOE as requiring some type of environmental activities, primarily operational compliance.[12]

Energy Research Office. Two facilities in DOE's Energy Research Office are listed on the NPL: the Brookhaven National Laboratory in New York, and the Oak Ridge National Laboratory (ORNL) in Tennessee, a part of the Oak Ridge Reservation.[13] The Brookhaven Laboratory has groundwater contaminated with both chemical and radioactive substances. The ORNL has groundwater contaminated with radioactive wastes and surface water and sediments contaminated with both chemical and radioactive substances that have moved off-site.

Nuclear Energy Office. The five special remedial action projects managed by the Nuclear Energy Office include the Surplus Facilities Management Program (SFMP), the Formerly Utilized Sites Remedial Action Program (FUSRAP), the Uranium Mill Tailings Remedial Action Project (UMTRAP), the Grand Junction Remedial Action Project (GJRAP), and the West Valley Demonstration Project.

o The SFMP was begun in 1978 to clean up sites contaminated with radioactive wastes at surplus DOE facilities. Cleanup also involves D&D of inactive facilities where radioactive wastes were treated and stored, and monitoring environmental activities. Currently, 20 facilities are in this program, 10 of which represent specific sites or buildings at active DOE facilities under other DOE offices.[14] Several significant projects are the Weldon Spring Site Remedial Action Project in Missouri and the Monticello Remedial Action Project in Utah, both listed on the NPL, and the Niagara Falls Storage Site in New York.

---

[12] For example, the Continuous Electron Beam Accelerator Facility in Virginia, managed by the Energy Research Office, is currently under construction. Only operational compliance costs are projected for this facility. The Solar Energy Research Institute in Colorado, within the Office of Conservation and Renewable Energy, is listed on the federal docket as a hazardous waste generator but has no environmental contamination. Almost all of the costs associated with this facility are for routine environmental, safety, and health-related actions. The Waste Isolation Pilot Plant in New Mexico, within the Defense Programs Office, is currently being built and was included in the Department of Energy's *Needs Report* because it will require operational compliance in future years.

[13] The Oak Ridge Reservation includes the Oak Ridge Gaseous Diffusion Plant and the Y-12 Plant, both in the Defense Weapons Complex, and the Oak Ridge National Laboratory and the Oak Ridge Associated Universities, both within the Nuclear Energy Office. The first three of these DOE facilities are listed on the National Priorities List.

- FUSRAP was established in 1974 to identify and carry out remedial actions at radioactive sites used by DOE predecessor agencies--the Manhattan Engineer District and the Atomic Energy Commission. Congressional legislation has added other commercial sites to the program for decontamination research and development. Currently, 29 facilities or properties are in this program. The W.R. Grace and Company facility and the Maywood Chemical Company Site, both in New Jersey, are on the federal docket and listed on the NPL as federal facilities since the DOE owns some property there. In addition, the St. Louis Airport Storage Site in Missouri is on the NPL with DOE listed as a PRP to this waste site.

- The UMTRAP was mandated in 1978 (Public Law 95-604) to carry out remedial actions of radioactive wastes at 24 inactive sites for uranium mill processing and several thousand properties in the vicinity. No site-specific characterizations or cost estimates were provided in DOE reports because all sites are contained under the single UMTRAP listing. The remedial actions are intended to stabilize the residual mill tailings and other remaining radioactive materials, to minimize radiation health hazards to the public, and, eventually, to dispose of the radioactive materials. None of the UMTRAP sites are listed or being considered for proposal to the NPL at this time.

- GJRAP was created in 1972 (under Public Law 92-314) to provide emergency cleanup at 594 buildings around Grand Junction, Colorado, that were contaminated with uranium mill tailings. This program is listed on the federal docket as one facility. All remedial actions were completed in 1988 at a total project cost of $22.7 million.

- The West Valley Demonstration Project carries out high-level radioactive waste management at the only commercial reprocessing facility for nuclear fuel operated in the United States. The facility was permanently closed in 1976 and is owned by the New York State Energy Research and Development Authority. In 1980, the Congress mandated (P.L. 06-368) that DOE should take actions at the West Valley Project to solidify the liquid high-level waste, develop containers for its permanent disposal, transport it to a federal waste repository, and provide for D&D of the facility. The federal government will provide 90 percent of these project costs; New York State is responsible for the remaining 10 percent.

---

[14] The sites included in the Surplus Facilities Management Program and the Formerly Utilized Sites Remedial Action Program are those identified in the Department of Energy *Needs Report*, Vol. 2 (December 1988).

Fossil Energy Office. The most serious environmental problems found at facilities within the Fossil Energy Office exist at the Naval Petroleum Reserves in California. The problems at this facility include oil and gas spills, air pollutant emissions, and various safety and health deficiencies.

Power Marketing Administrations. The Bonneville Power Administration (BPA) and the Western Area Power Administration (WAPA) are federal marketing agencies for electric power in the Pacific Northwest and in 15 western and central states. These agencies operate a network of transmission facilities. One of these, the BPA Ross Complex in Washington, is listed on the NPL. This site has groundwater and soil contaminated by chemical wastes. Most of the cleanup actions needed at the other facilities result from soil contaminated with polychlorinated biphenyls (PCBs) and volatile organic compounds.

The Naval Reactors Program was created by Executive Order 12344 (Public Law 98-525) as a joint effort by DOE and the Department of the Navy to manage all naval nuclear propulsion activities. Four Navy laboratories for atomic power are listed on the federal docket. These laboratories provide research and development activities and have several prototype reactors for testing nuclear propulsion.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

DOE has completed Preliminary Assessments/Site Investigations (PA/SI) at almost all of the 66 facilities listed on the federal docket. DOE has planned or initiated a Remedial Investigation/Feasibility Study (RI/FS) at most of the 16 sites listed on the NPL. Table 13 shows the status of activities that have been undertaken at the 108 DOE facilities included in the CBO study.

Although interim remedial actions are under way at some facilities, DOE is still trying to characterize and assess the extent of contamination. Most of the major remedial action projects will not begin for several years. In some cases, DOE has been criticized for inadequate sampling and monitoring of waste sites and for insufficient interim remedial actions that would prevent further contamination and decrease future cleanup costs.[15]

Most of the NPL sites will take more than 20 years to clean up, especially those in the DWC, according to estimates provided in the *Needs Report*, volume 2 (see Table 13). These preliminary schedules for corrective actions and cleanup activities do not reflect any budgetary limitations. Inadequate funding could delay the scope and timing of the proposed cleanup.

---

[15] Government Accounting Office, *Nuclear Health and Safety, Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion* (July 1988); and testimony of Dan Reicher and James D. Werner on behalf of the Natural Resources Defense Council, "Management of the Department of Energy's Environmental Cleanup Program," before the Senate Armed Services Committee (April 7, 1989).

TABLE 13. STATUS OF INVESTIGATIONS AND CLEANUP AND PROJECTED CLEANUP SCHEDULES AT DEPARTMENT OF ENERGY FACILITIES

Facility	Preliminary Assessment/ Site Investigation	Remedial Investigation/ Feasibility Study	Remedial Design/ Remedial Action	Cleanup Schedule (In Years)[a]
Defense Programs Office				
Feed Materials Production Center	X	under way	ongoing	14-22
Hanford Reservation	X	under way	–	30
Idaho National Engineering Laboratory	X	under way	–	27-37
Kansas City Plant	X	under way	ongoing	10-12
Lawrence Livermore National Laboratory	X	under way	ongoing	23-50
Los Alamos National Laboratory	X	under way	–	21-26
Mound Plant	X	under way	–	22
Nevada Test Site	X	under way	–	21-30
Oak Ridge Gaseous Diffusion Plant	under way	under way	–	32
Pantex Plant	X	under way	–	11-16
Pinellas Plant	X	under way	ongoing	22
Residual Nuclear Explosive Sites	under way	–	ongoing	5
Rocky Flats Plant	X	under way	–	15-22
Sandia National Laboratories-Albuquerque	X	under way	–	12-20
Tonopah Test Range	X	under way	–	–
Kauai Test Facility	X	–	–	–
Sandia National Laboratories-Livermore	X	under way	–	8-13
Savannah River Plant	X	–	ongoing	32
Waste Isolation Pilot Plant	NR	NR	NR	NA
Y-12 Plant	under way	under way	ongoing	25-32
Energy Research Office				
Ames Laboratory	X	–	ongoing	1
Argonne National Laboratory-East	X	–	–	9-12
New Brunswick Laboratory	X	–	–	–
Brookhaven National Laboratory	X	under way	ongoing	7-12
Continuous Electron Beam Accelerator Facility	NR	NR	NR	NA
Fermi National Accelerator Laboratory	X	–	–	2
Inhalation Toxicology Research Institute	X	–	–	5-7
Laboratory for Energy-Related Health Research	NR	–	–	7-11
Lawrence Berkeley Laboratory	under way	–	–	7
Oak Ridge Associated Universities	under way	–	–	3
Oak Ridge National Laboratory	X	under way	–	23-25
Princeton Plasma Physics Laboratory	X	–	complete	
Stanford Linear Accelerator Center	X	–	–	5-10

(Continued)

TABLE 13. (Continued)

Facility	Preliminary Assessment/ Site Investigation	Remedial Investigation/ Feasibility Study	Remedial Design/ Remedial Action	Cleanup Schedule (In Years)[a]
	Nuclear Energy Office			
Argonne National Laboratory-West	under way	–	–	22
Formerly Utilized Sites Remedial Action Program				18
Maywood Chemical Company	X	under way	ongoing	–
W.R. Grace-Wayne Site	X	under way	ongoing	–
Colonie	X	under way	ongoing	–
Niagara Falls	X	–	complete	–
Ashland Oil No. 1	X	under way	–	–
Ashland Oil No. 2	X	under way	–	–
Linde Air Products	X	under way	–	–
Mallinckrodt	X	under way	–	–
Acid/Pueblo Canyon	X	–	complete	–
Albany Research Center	–	–	–	–
Bayo Canyon	X	–	complete	–
Chupadera Mesa	X	–	complete	–
Dupont & Company	–	–	–	–
General Motors	–	–	–	–
Hazelwood	X	under way	–	–
Kellex/Pierpont	X	–	complete	–
Middlesex Landfill	X	–	complete	–
Middlesex Sampling Plant	X	under way	ongoing	–
National Guard Armory	X	–	complete	–
Palos Park Forest Preserve	X	–	complete	–
Seaway Industrial Park	X	under way	–	–
Seymor Specialty Wire	–	–	–	–
Shpack Landfill	–	–	–	–
St. Louis Airport Storage Site	X	under way	–	–
St. Louis Airport Vicinity Properties	under way	–	–	–
Universal Cyclops	–	–	–	–
University of California	X		complete	
University of Chicago	X	–	complete	–
Vetron	–	–	–	9-10
Paducah Gaseous Diffusion Plant	under way	under way	ongoing	9-10
Portsmouth Gaseous Diffusion Plant	under way	–	ongoing	22
Energy Technology Engineering Center (Santa Susana Field Laboratory)	under way	–	–	20-25
Surplus Facilities Management Program	–	–	–	12
Weldon Spring Site	X	under way	ongoing	–
Center for Energy and Energy Research	NR	–	complete	–
Monticello Remedial Action	X	under way	ongoing	–
Niagara Falls Storage Site	X	–	–	–

(Continued)

TABLE 13 (Continued)

Facility	Preliminary Assessment/ Site Investigation	Remedial Investigation/ Feasibility Study	Remedial Design/ Remedial Action	Cleanup Schedule (In Years)[a]
Laboratory for Energy-Related Health Research	NR	–	–	–
Santa Susana Field Laboratory	under way	–	–	–
Idaho National Engineering Laboratory	X	under way	ongoing	–
Argonne National Laboratory	X	–	–	–
Piqua Nuclear Power Station	X	–	complete	–
Nevada Test Site	X	under way	ongoing	–
Los Alamos Laboratory	X	under way	ongoing	–
Bettelle Columbus Laboratory	–	–	–	–
Hallam Nuclear Power Station	X	–	complete	–
Mound Plant	X	under way	ongoing	–
Plutonium Fuel Fabrication Facility	X	–	complete	–
Shippingport Station	X	–	complete	–
Boiling Nuclear Superheater Power Station	X	–	complete	–
Savannah River Plant	X	–	–	–
Oak Ridge National Laboratory	X	under way	–	–
Hanford Reservation	X	under way	ongoing	–
Uranium Mill Tailings Remedial Action Project	under way	–	ongoing	6
Grand Junction Project	X	–	complete	completed
West Valley Demonstration Project	NR	–	–	30
Conservation and Renewable Energy Office				
Solar Energy Research Institute	X	NR	NR	4-7
Fossil Energy Office				
Component Development and Integration Facility	X	NR	NR	13-22
Morgantown Energy Technology Center	under way	–	–	2
National Institute for Petroleum Research	X	–	–	7
Naval Petroleum Reserve No. 3	–	–	–	13-22
Naval Oil Shale Reserve No. 1, 2, and 3	–	–	–	4
Naval Petroleum Reserve-California	X	under way	ongoing	1
Pittsburgh Energy Technology Center	under way	–	–	–

(Continued)

TABLE 13. (Continued)

Facility	Preliminary Assessment/ Site Investigation	Remedial Investigation/ Feasibility Study	Remedial Design/ Remedial Action	Cleanup Schedule (In Years)[a]
Strategic Petroleum Reserve	–	–	–	–
Weeks Island Reserve	X	–	–	–
Big Hill Reserve	X	–	–	–
Great Plains Coal Gasification Plant	NR	–	–	–
Power Marketing Administrations				
Bonneville Power Administration	–	–	–	22
Burley Maintenance Headquarters	X	–	–	–
Troutdale	–	–	–	–
Alvey	–	–	–	–
Snohomish	–	–	–	–
Olympia	–	–	–	–
Bell	–	–	–	–
Custer	–	–	–	–
Columbia	–	–	–	–
Midway	–	–	–	–
Ross	X	under way	–	–
Covington	–	–	–	–
Western Area Power Administration	–	–	–	6
Power Operations	–	–	–	–
Hinton Hazardous Waste Site	–	–	–	–
Watertown	–	–	–	–
Naval Reactors Program				
Knolls Atomic Laboratory-Windsor	X	–	–	–
Knolls-Kesselring	X	–	ongoing	–
Knolls-Knolls	X	–	ongoing	–
Bettis Atomic Laboratory	X	–	ongoing	–

SOURCE: Department of Energy, *Annual Report to Congress for Fiscal Year 1988* under the Comprehensive Environmental Response, Compensation, and Liability Act (December 1988), and Congressional Budget Office based on conversations and written information with officials from DOE.

NOTES: Activity is not required at this facility.

X = Activity completed at this facility.

– = Activity not yet initiated at this facility.

a. The range of the cleanup schedule is based on the expected and high cases of environmental actions included in the DOE *Needs Report*, Volume 2 (December 1988).

Defense Weapons Complex Facilities

PA/SI's have been completed for most of the 20 DWC facilities; an RI/FS investigation is under way at the 9 facilities on the NPL--except for the Savannah River Plant. An interagency agreement has already been signed for each of these facilities or is being negotiated between DOE and EPA and, in most cases, the affected state. Remedial activities are under way at four facilities. Three facilities are expected to be cleaned up within 10 years, at the earliest, while 13 other facilities may take 20 years or more. Some facilities have sites that may never be completely cleaned up; these facilities will have to be permanently sealed off from the public.[16]

- The Lawrence Livermore National Laboratory is being investigated and cleaned up under a Federal Facility Agreement (FFA) signed in November 1988. An RI/FS has been done for the facility. More than 200 wells are monitoring the contamination in the groundwater, both on and off-site. No significant interim remedial actions have been taken. DOE estimates that it will take between 23 and 50 years to clean up this facility fully.

- At the Rocky Flats Plant, the state of Colorado, EPA, and DOE signed a Compliance Agreement in 1986. Negotiations for an FFA are currently in progress. An RI/FS has been completed or is in progress at most of the sites at this facility; at this time, no remedial actions have begun. An interim remedial action for groundwater contamination was scheduled to begin in January 1990. DOE expects to clean up the plant in 15 to 22 years.

- At the Hanford Reservation, which has four areas on the NPL--known as the 100, 200, 300, and 1100 Areas--an FFA has been signed. DOE has identified at least 1,500 inactive waste sites in these areas. Under the current plans, the RI's were scheduled to start in 1989; the cleanup process is currently expected to take 30 years. Some technology needed to clean up certain types of wastes at the Hanford sites has not yet been developed, and some areas may never be cleaned up completely.

- At the Feed Materials Production Center (FMPC), a Compliance Agreement was signed between DOE and EPA in July 1986. Under this agreement, the RI/FS is under way and scheduled to be completed by May 1990. An FFA was recently signed by DOE and EPA for the removal of the hazardous wastes and for other cleanup activities at the FMPC. Initial remedial actions have been completed or are ongoing in four areas. DOE expects to take 14 to 22 years to clean up this complex.

---

[16] Some of the Department of Energy sites within the Defense Weapons Complex are so contaminated with radioactive or mixed wastes that it may not be technically or economically feasible to clean them up completely for any potential land use. These sites are located at the Hanford Reservation, the Rocky Flats Plant in Colorado, and the Feed Materials Production Center in Ohio. At these sites, DOE may "entomb" or seal the designated areas with a concrete barrier and guard the fenced-off sites permanently.

- At the Idaho National Engineering Lab, DOE and EPA signed a Consent Order and Compliance Agreement in July 1987. An FFA was initiated in 1989 with EPA and the state of Idaho. The RI/FS is under way. DOE estimates that it will take 27 to 37 years to clean up the hazardous waste sites at this facility.

- At the Mound Plant in Ohio, an FFA was expected to be signed in 1989 between DOE and EPA. A Consent Order, which will require identical technical work, is being negotiated with the state of Ohio. RI/FS efforts are ongoing in connection with all separate operating units at this facility. The cleanup process is expected to last 22 years.

- At the Oak Ridge Reservation, an FFA with EPA and the state of Tennessee has been negotiated and is in the process of approval by DOE. The FFA will include cleanup programs for the ORNL and the Gaseous Diffusion Plant and the Y-12 Plant within the DWC. Some RI/FS work is being done, although some of the PA/SI studies are incomplete. The cleanup effort at these facilities may take up to 32 years.

- The Savannah River Plant has discussions in process for an FFA. At least 66 and possibly more inactive hazardous waste sites exist at this plant. An SI has not been submitted to the EPA, although apparently most of the investigation has been completed. Some remedial actions have been initiated, and full cleanup is expected to last 32 years.

Current estimates of the cleanup activities required at the 11 DWC facilities not on the NPL range from 5 to 30 years. RI/FS efforts are under way at many of these facilities to determine the appropriate cleanup actions, even if the facilities are never listed on the NPL. Some cleanup actions are under way or planned for fiscal year 1990 at the Sandia National Laboratories in Livermore, California, the Los Alamos National Laboratory in New Mexico, the Kansas City Plant in Missouri, and the Pinellas Plant in Florida.

Energy Research Office

Of the 13 Energy Research facilities identified as having some environmental requirements, 2 may require only operational compliance.[17] The other 11 facilities have completed or are currently performing PA/SIs; RI/FS work has begun at 2 facilities that are listed on the NPL: the Brookhaven National Laboratory and the ORNL. An FFA has been initiated at both of these facilities. (The FFA for the Oak Ridge Reservation includes the cleanup work for the ORNL.)

Some remedial actions are under way at Brookhaven, and remedial work is almost complete at both the Princeton Plasma Laboratory in New Jersey and the Ames Laboratory in Iowa. Four facilities are projected to take longer than 10 years to clean up. Of these, the ORNL has the most extensive hazardous waste management problems, requiring from 23 to 25 years to clean up.

---

[17] The Continuous Electron Beam Accelerator is still under construction. At this time, it is unknown whether any contamination exists at the Laboratory for Energy-Related Health Research, located at the University of California at Davis.

Nuclear Energy Office

At the Paducah and Portsmouth Gaseous Diffusion Plants in Kentucky and Ohio, respectively, the PA/SI studies have been completed; some interim remedial actions are under way. At the Paducah Plant, a CERCLA Consent Order between DOE and EPA was signed and the RI/FS is scheduled. A RCRA Consent Order between DOE and EPA should be signed shortly for the Portsmouth Plant. A Cleanup Order has been issued by the state of Ohio to the DOE, requiring further facility investigations and corrective actions. The SI is under way at the Energy Technology Engineering Center in California. Sampling and characterization studies are ongoing at the Argonne Laboratory-West, where DOE expects to take up to 22 years to complete the anticipated remedial actions.

Surplus Facilities Management Program. Of the 20 sites currently included in the SFMP, 2 are on the NPL. The Weldon Spring Site is being cleaned up under an FFA signed by DOE, EPA, and the state of Missouri in August 1986. An RI/FS is scheduled to be completed in 1990. An FFA has also been signed for the cleanup of the Monticello Vicinity Properties and Mill Site in Utah. The RI/FS is almost complete, and 51 of the 75 properties have been cleaned up. Cleanup activities at two SFMP sites have been completed. DOE estimates that it will take 12 years to complete remedial actions at all SFMP sites.

Formerly Utilized Sites Remedial Action Program. RI/FS work is ongoing at 3 of the 29 sites identified in the FUSRAP: the W.R. Grace and Company Site and the Maywood Chemical Company Site (both listed on the NPL), and the Colonie New York Site. Removal actions have been completed at eight of the sites in the program. DOE expects to clean up all FUSRAP sites in the next 18 years.

Uranium Mill Tailings Remedial Action Project. None of the UMTRAP properties is on the NPL or under consideration. Remedial actions at 2 of the 24 sites in the UMTRAP are complete; they are under way at 10 more, 3 of which were scheduled to be completed in 1989. The other 12 sites are in the site investigation and remedial design stage; the engineering studies have been completed at all but 2 of these.

Grand Junction Remedial Action Project. The GJRAP is listed on the federal docket, and DOE has completed a PA/SI. Cleanup activities were also completed at all 594 buildings included in this project; no further remedial actions will be initiated. (Some nonemergency cleanup actions at these properties were transferred to UMTRAP, including the final disposal of the pile of uranium mill tailings cleaned up at these buildings.)

West Valley Demonstration Project. DOE has not prepared a PA/SI at this project facility since it is not listed on the docket and is not actually owned by DOE. DOE estimates that its radioactive waste operations will continue at the site for 30 years, when DOE will ship the last of the radioactive waste to a high-level waste repository and D&D the facility.

Fossil Energy Office

PAs have been submitted for 7 of the 10 Fossil Energy facilities, and SIs have been completed at 2: the Bartlesville Energy Technology Center in Oklahoma, and the Naval Petroleum Reserve in California. Remedial activities are under way at this last site and are expected to continue for 13 to 22 years. Most of the other sites require only operational compliance, and few remedial actions have been indicated. No further actions will be required at the Component Development Integration Facility in Montana. DOE's liabilities for any remedial actions at its recently sold Great Plains Coal Gasification Plant in North Dakota are unclear.

Power Marketing Administrations

Most of the environmental activities that will be required at the BPA and WAPA facilities are only operational compliance. At the Ross Complex facility on the NPL, however, a draft SI has been submitted to EPA and an RI/FS will be initiated shortly. At the WAPA Hinton Hazardous Waste Storage Facility in Iowa, a Compliance Agreement has been negotiated for cleaning up soil contaminated by PCBs. Cleanup of PCB-contaminated soil is under way at another WAPA site. DOE estimates that remedial work at BPA stations may not be completed for 22 years. Cleanup of all WAPA sites is expected to take up to six years.

Naval Reactors Program

All four of the federal docket facilities within the Naval Reactors Program have completed PAs. The assessments indicate that none of these facilities will be included on the NPL. Some actions are under way to deal with limited remedial actions required at these facilities.

PROJECTED COSTS AND BUDGETARY IMPACT

While the full costs of cleaning up all DOE facilities and achieving compliance with current environmental laws is uncertain, the DOE *Five-Year Plan* indicated that more than $19 billion would be needed between 1991 and 1995 for DOE's environmental program. This estimate does not include the roughly $2 billion in costs for operational compliance reflected in the *Needs Report*. Overall, preliminary estimates published in the *Needs Report* indicate that compliance and cleanup costs may run as high as $71 billion to $111 billion. most of which will be incurred at DWC facilities.[18] A July 1988 General Accounting Office (GAO) report, *Dealing With Problems in the Nuclear Defense Complex Expected to Cost Over $100 Billion*, projected DOE's environmental compliance and cleanup costs for the DWC at $80 billion to

---

[18] These figures exclude costs to comply with safety and health requirements but include "base" or routine operational compliance costs.

$110 billion, not including operational compliance costs.[19] Again, both DOE and GAO have cautioned that these figures are preliminary.

Environmental Activities

The Congress appropriated $2.22 billion for DOE environmental activities in fiscal year 1990. Of this, $125 million is for hazardous waste compliance and corrective actions at currently operating DOE facilities; $784 million is for hazardous waste investigation and cleanup at inactive DOE sites; and $1,310 million is for waste management operations. Another $400 million is expected to be spent on operational compliance costs at currently operating DOE facilities. For fiscal year 1991, DOE has requested $2.8 billion, not including the estimated $400 million for operational compliance.

The fiscal year 1990 appropriations for DOE environmental activities provide only between 2 percent to 4 percent of the total environmental funding that DOE currently estimates needing--that is, between $71 billion and $111 billion for all compliance, cleanup, and waste management activities. DOE is primarily doing investigations at its facilities. DOE indicated that the larger costs will be incurred when more of the waste cleanup actions get under way within the next few years.

Hazardous Waste Activities

DOE spending levels for hazardous waste compliance, cleanup, and waste management activities from 1991 to 1995 were projected in the DOE *Five Year Plan* and are shown in Table 14. Activities at all DOE facilities with environmental requirements are estimated to cost about $19.2 billion over this five-year period, with almost $15 billion targeted for DWC facilities. These costs do not reflect the estimated $2 billion for the operational compliance expected over this period.[20] DOE stated that these costs are likely to change. As further site investigations and RI/FSs are completed and more definitive cleanup projects are planned, these costs will be revised annually.

Since the environmental activities needed at the DWC make up the bulk of DOE environmental compliance and cleanup costs, the cost estimates for these facilities are provided in Table 15. For fiscal year 1990, the Savannah River Plant, the Hanford Reservation, and the Idaho National Engineering Laboratory will require about $1.3 billion. These three facilities account for about 67 percent of the DWC environmental compliance, cleanup, and waste management costs for 1990 (excluding costs for operational compliance). Between 1991 and 1995, DOE expects

---

[19] The General Accounting Office report also estimated the costs of upgrading and modernizing the Department of Energy's Defense Weapons Complex, adding another $35 billion to $45 billion to the GAO cost projections. The Congressional Budget Office analysis does not include costs associated primarily with the DWC modernization effort.

[20] The estimated $15 billion in costs attributed to the Defense Weapons Complex may differ slightly from the costs of all activities targeted for the defense weapons program; some operations at non-DWC facilities, such as the Oak Ridge National Laboratory, may also support DWC-related missions.

TABLE 14. PROJECTED SPENDING FOR ENVIRONMENTAL ACTIVITIES AT THE DEPARTMENT OF ENERGY FOR FISCAL YEARS 1991-1995 (In millions of dollars)

Environmental Cleanup	Compliance[a]	Hazardous Waste Management	Total
Defense Weapons Complex			
4,177	584	9,985	14,746[b]
All Other Facilities			
2,598	104	1,716	4,418
Routine Operational Compliance[c]			
NA	2,000	NA	2,000
Total			
6,775	2,688	11,701	21,164

SOURCE: Department of Energy *Environmental Restoration and Waste Management Five-Year Plan* (September 1989).

NOTE: NA = Not applicable.

[a] The compliance activities do not include those associated with safety and health requirements.

[b] The costs attributed to the Defense Weapons Complex may differ slightly from the costs of all activities for the defense weapons program; some operations at non-DWC facilities, such as the Oak Ridge National Laboratory, may support DWC-related missions.

[c] Costs of $400 million per year for routine operational compliance were reported in the DOE *Needs Report*.

TABLE 15. PROJECTIONS FOR ESTIMATED COSTS OF ENVIRONMENTAL ACTIVITIES AT DEPARTMENT OF ENERGY FACILITIES FOR FISCAL YEARS 1991-1995, AND TOTAL LIFETIME COSTS (In millions of dollars)

Facility	1991-1995	Total Expected	Total High
Feed Materials Production Center	889	1,808	4,337
Hanford Reservation	3,803	36,193	56,120
Idaho National Engineering Laboratory	2,158	3,393	5,990
Kansas City Plant	97	270	273
Lawrence Livermore National Laboratory	331	513	753
Los Alamos National Laboratory	416	2,167	2,697
Mound Plant	237	513	630
Nevada Test Site	272	1,175	1,610
Oak Ridge Gaseous Diffusion Plant	896	2,114	2,663
Pantex Plant	77	431	487
Pinellas Plant	28	55	55
Residual Nuclear Explosive Sites	NA	60	38
Rocky Flats	472	651	711
Sandia National Laboratory-Albuquerque	227	251	288
Tonopah Test Range[a]			
Kauai Test Facility[a]			
Sandia National Laboratory-Livermore	18	39	49
Savannah River Plant	3,350	9,230	19,440
Waste Isolation Pilot Plant	531	1,717	1,870
Y-12 Plant	943	1,910	2,580
Subtotal, Office of Defense Programs	14,746	62,490	100,591
Other Facilities	4,418	8,798	10,227
Routine Operational Compliance	2,000[b]	[c]	[c]
Total DOE	21,164	71,288	110,818

SOURCE: Projections of estimated costs for fiscal years 1991-1995 are from the Department of Energy, *Environmental Restoration and Waste Management Five-Year Plan*; total projections are from the DOE *Needs Report*, Volume 2, and reflect the expected and high-cost scenarios presented in the report.

NOTE: The total cost projections for DOE's environmental activities from the *Needs Report* exclude all safety and health compliance activities, which are also excluded from the fiscal year 1991-1995 projections.

NA: Costs for these sites were not available for 1991-1995.

[a] Cost projections for the Tonopah and Kauai Test Sites are included in the estimates for the Sandia National Laboratory in Albuquerque, New Mexico.

[b] Costs for routine operational compliance were excluded from the cost estimates of the facility's Five-Year Plan. Based on the costs of these activities reflected in the *Needs Report*, costs for routine operational compliance were estimated at $400 million per year, and $2.0 billion over the 1991-1995 period.

[c] Costs for routine operational compliance are included in the total cost estimates provided in the *Needs Report*, Volume 2, and reflect these costs through 2010.

to incur liabilities of $9.3 billion at these three facilities alone.

Long-Term Environmental Costs

DOE estimates that total costs for its environmental requirements over the next 30 years will be from $71.3 billion to $110.8 billion. About 90 percent of these costs are for the DWC facilities--between $62.5 billion and $100.6 billion--as estimated in the *Needs Report* and shown in Table 15. About $36 billion to $56 billion (almost 60 percent of DWC total costs) is projected for environmental activities at the Hanford Reservation alone. The second most costly site is the Savannah River Plant, estimated to require between $9 billion and $19 billion.

Six other DWC facilities are currently estimated to need more than $1 billion in lifetime environmental requirements: the Feed Materials Production Center, the Los Alamos National Laboratory, the Nevada Test Site, the Waste Isolation Pilot Plant, the Oak Ridge Gaseous Diffusion Plant, and the Y-12 Plant also in Oak Ridge, Tennessee.

DOE cost projections for environmental compliance, cleanup, and waste management activities at facilities not included in the DWC range from $8.8 billion to $10.2 billion (see Table 15). The ORNL is projected to need more than $3 billion in environmental spending. The FUSRAP, SFMP, and West Valley Demonstration Project within the Nuclear Energy Office are expected to cost almost $1 billion each over the next 30 years.

The 13 facilities in the Energy Research Office may require between $3.6 billion and $4.3 billion in environmental spending (up to 5 percent of total DOE environmental costs). The Nuclear Energy Office is projected to spend roughly $4 billion (about 5 percent of projected total costs for DOE environmental funding requirements). The Fossil Energy Office is expected to require $500 million to $800 million in lifetime environmental costs, most of which is attributed to the Naval Petroleum Reserve in California. The two Power Marketing Administrations are currently projected to need about $600 million for all environmental activities. The Office of Naval Reactors estimates that it will spend about $5 million per year from fiscal year 1990 for environmental activities, amounting to about $110 million through 2010.

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) has 14 facilities listed on the November 1988 update of the federal docket; one formerly owned site that may require remedial action; and 58 underground storage tanks (USTs).[21] In addition, EPA is a Potentially Responsible Party at six privately owned facilities on the National Priorities List. The EPA budget for fiscal year 1990 includes about $700,000 for site investigations at three EPA facilities and for replacement of a number of USTs. EPA requested $2.55 million for fiscal year 1991 for these environmental activities in compliance with hazardous waste laws.

NUMBER AND TYPES OF FACILITIES OR SITES

The EPA operates a number of laboratories and field test stations, some of which have generated, stored, and disposed of hazardous substances. In addition, EPA has occasionally introduced contaminants into the environment under controlled conditions for purposes of testing. The majority of EPA facilities on the federal docket are laboratories that have generated or stored hazardous wastes but have had no releases or contamination.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

A preliminary assessment has been submitted for all the EPA facilities on the docket. Based on these assessments, EPA anticipates that 4 facilities may require further investigation or remedial actions, while 10 will require no further action.

The Department of Defense (DoD) has contributed to the contamination at three of the four EPA facilities that require further action. DoD will complete any further remedial action that is necessary at the two facilities where DoD was the sole cause of the contamination. DoD and EPA share responsibility for the third facility, the Environmental Photographic Interpretation Center that is located on the Department of the Army's Vint Hill base in Virginia. EPA requested funding in fiscal year 1990 for further investigation of this site. The fourth EPA site requiring further action is the Gulf Breeze Laboratory in Florida.

In addition, EPA will investigate possible off-site contamination at a formerly used property at Washington State University where the EPA studied the migration of certain hazardous chemicals.

---

[21] The November 16, 1988, docket lists 17 facilities for the Environmental Protection Agency. Three of these, however, are small quantity generators of hazardous wastes and, thus, should be exempt from the docket. EPA has requested that these three facilities be delisted from the docket.

EPA will complete program requirements for 24 of its 58 USTs with funding authorized for fiscal years 1988 and 1989. EPA expects to complete the cleanup requirements for its UST program by the end of 1991.

PROJECTED COSTS AND BUDGETARY IMPACT

EPA's budget appropriations for fiscal year 1990 include $300,000 to investigate further hazardous waste problems and $400,000 for its UST program. EPA spent $800,000 in fiscal year 1989 and $300,000 in fiscal year 1988 for UST program requirements. For fiscal year 1991, EPA has submitted a budget of $2.55 million for hazardous waste investigations and UST program activities.

GENERAL SERVICES ADMINISTRATION

The General Services Administration (GSA) owns 18 facilities listed on the November 1988 update of the federal docket and about 500 underground storage tanks (USTs).[22] In addition, GSA has been named as a Potentially Responsible Party at two facilities on the National Priorities List. GSA was not appropriated any specific funds in fiscal year 1990 for investigation or cleanup of hazardous waste sites or for activities stemming from UST program requirements. Some hazardous waste activities, such as facility investigations, were funded out of operation and maintenance budgets instead. GSA officials estimate that the agency will need roughly $4 million to $6 million over the next five years to meet UST requirements.

NUMBER AND TYPES OF FACILITIES OR SITES

GSA owns about 1,600 buildings, most of which are occupied by other federal agencies. In some cases, GSA provides all the custodial and maintenance services. GSA is not liable, however, for any hazardous wastes generated by the operations of the tenant agencies. Generally, GSA is responsible for its own USTs, the removal of asbestos and polychlorinated biphenyls (PCBs), and the proper disposal of the wastes generated in association with these projects.

The 18 GSA facilities on the docket fall into three general categories: federal office buildings, federal supply depots, and National Defense Stockpile (NDS) warehouses. The NDS is a system of approximately 15 warehouses located around the country that stockpile strategic minerals, such as lead, rubber, and iodine; 3 of these warehouses are included on the docket. Responsibility for the NDS was recently transferred to the Department of Defense. The 14 federal buildings listed had at one time applied for a permit to remove hazardous materials, such as asbestos or PCB transformers.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

Preliminary assessments have been submitted for 16 of the 18 GSA facilities on the docket. The completed assessments indicated that no further action was necessary at 13 facilities, including the 3 NDS facilities. At three facilities, ongoing investigations will determine whether further action will be required: one is operated by the Army Corps of Engineers, which is conducting the investigation; one is a former site of the Department of the Army; and the third is a GSA facility.

---

22. The November 16, 1988, docket update attributed 20 federal facilities to the General Services Administration. One of these is a small quantity generator and should not be listed, and one was listed erroneously as a hazardous waste generator when no hazardous wastes were ever generated there. Thus, GSA is only responsible for 18 docket facilities.

PROJECTED COSTS AND BUDGETARY IMPACT

GSA does not expect to face significant liability for hazardous waste contamination at any of its facilities. GSA is implementing a program to comply with regulatory requirements for USTs. Funding for this UST program is currently estimated at $4 million to $6 million over the next five years.

MAJOR UNCERTAINTIES

GSA may be held responsible for contamination at some properties that GSA or its predecessor agency, the War Assets Administration (WAA), sold in the past. The WAA was formed to sell off industrial assets that the United States had accumulated during World War II. As a result, GSA is the last--and occasionally the only--owner of record at many of these formerly owned government properties.

Also, in a joint program with the Department of Health and Human Services, GSA has leased vacant public land to municipalities for use as sanitary landfills. While sanitary landfills are not authorized to accept hazardous wastes, they often do so inadvertently or illegally. It was estimated that 30 to 40 landfills have been operated on GSA lands. These landfills could be returned to GSA upon termination of the lease, leaving the agency potentially responsible for any cleanup requirements at these sites. GSA will attempt to change the current leases with the operators of municipal landfills in order to avoid any future liability.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

The Department of Health and Human Services (HHS) has four facilities listed on the November 1988 update of the federal docket. According to HHS officials, investigations of these facilities indicate that no further action will be required. HHS has been named a Potentially Responsible Party at three facilities on the National Priorities List. The number of underground storage tanks (USTs) located at HHS facilities is not available. HHS did not submit any budget requests for environmental activities in fiscal year 1990 or beyond.

NUMBER AND TYPES OF FACILITIES OR SITES

The Public Health Service (PHS) within HHS includes the Food and Drug Administration, the National Institutes of Health, and the Centers for Disease Control. These agencies operate research laboratories and testing facilities. On the original docket, 21 PHS facilities were listed; all but 4 were subsequently dropped. Most of the facilities were small quantity generators of wastes and did not qualify for listing.

The number of USTs controlled by HHS is not known on a departmentwide basis but is reported at the state level. Considering the number of medical facilities that the PHS operates, HHS may be responsible for several hundred USTs.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

At three of the four HHS facilities on the docket, preliminary assessments indicated that no further action was required. The Department of the Army owns the other facility; HHS uses part of it for a cancer research laboratory. The Army completed the preliminary assessment for this facility, which indicated that no further action was required.

While HHS does not have a program to implement the requirements for USTs, facility operators are apparently aware of the requirements and will repair or replace the USTs as necessary.

DEPARTMENT OF THE INTERIOR

The Department of the Interior (DOI) owns one facility listed on the National Priorities List (NPL), one facility proposed for the NPL, and 263 properties listed on the November 1988 update of the federal docket.[23] Six bureaus within DOI own one or more of the docket sites. Three bureaus own the large majority of sites: the Bureau of Land Management (BLM), the National Park Service (NPS), and the Fish and Wildlife Service (FWS). In addition to the two DOI sites on the NPL, DOI has been named a Potentially Responsible Party (PRP) at eight commercial sites on the NPL. The DOI has identified roughly 4,000 underground storage tanks (USTs) that may require investigation and repair or replacement.

DOI was appropriated $23.9 million in fiscal year 1990 for hazardous waste activities required under the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). This amount represented an increase of almost 50 percent from 1989. For fiscal year 1991, DOI has requested funding of $42.4 million for compliance activities under RCRA and CERCLA. Over the next five years, DOI has projected spending needs of about $300 million for activities related to hazardous waste requirements. The majority of these funds are earmarked for specific projects, such as remedial investigations and cleanup. These figures exclude some expenditures for site investigations, small removal actions, and replacement or repair of USTs.

NUMBER AND TYPES OF FACILITIES OR SITES

The DOI controls more than 500 million acres of public lands. Yet, few of the hazardous waste problems on DOI lands result from actual DOI operations. Instead, most of DOI's 263 docket facilities have problems caused by both authorized and unauthorized nonfederal users who have disposed of hazardous substances at mines, in landfills, and at other sites in the national parks, wildlife refuges, and public lands. The bureaus responsible for the 263 DOI docket facilities are: BLM for 199; FWS for 26; NPS for 20; Bureau of Reclamation (BOR) for 13; Bureau of Mines (BOM) for 4; and the U.S. Geological Survey for 1.

Bureau of Land Management

The BLM owns and manages 343 million acres of public lands. This vast acreage makes it difficult both to monitor and prevent illegal disposal of hazardous materials as well as to identify and assess the problems that have resulted from past activities. All BLM land is designated for multiple use, encompassing a wide range of commercial, recreational, and community uses from municipal garbage disposal to mining and refining operations. Some of these uses have resulted in contamination from hazardous materials.

---

[23] The November 16, 1988, docket update included 266 facilities of the Department of the Interior. Two of these facilities, however, are not owned by DOI, and one site was reported twice.

The BLM has been named the primary PRP at one privately owned mining site listed on the NPL, the Atlas Asbestos Mine in California. BLM also owns the one DOI site that is proposed for the NPL, the Lee Acres Landfill in New Mexico. In addition, BLM owns some land at another six mining sites listed on the NPL. At this time, whether BLM will be named as a PRP or be held liable for part of the cleanup operations at these sites is unclear.

Due to [illegible]ontinuous and vast nature of BLM's landholding, BLM and the Environmental [illegible]tection Agency (EPA) have found it impossible to group individual hazardous waste sites as part of a larger BLM landholding or "facility." Thus, BLM's 199 docket listings represent individual sites and not facilities. In contrast, a national forest or defense installation may have many individual waste sites. Consequently, BLM's separate docket listings make the agency appear as though it has a significantly larger number of facilities with potential hazardous waste problems or requirements than do other agencies. For example, the Forest Service in the U.S. Department of Agriculture has identified 58 national forest facilities, but they contain at least 132 individual sites that require investigation or cleanup for hazardous waste contamination.

Landfills. Under the Recreation and Public Purposes Act, the BLM has leased public lands to local jurisdictions for the operation of landfills. These landfills were available at low cost to help local communities consolidate and eliminate the roadside dumps that had become common in the period of growth in the western United States following World War II. Landfills opened before 1968 were not prohibited from accepting hazardous wastes until regulations were passed in 1978. As a result, many of these landfills have received a mixture of hazardous and nonhazardous wastes.

BLM has estimated that it authorized the operation of more than 500 landfills on BLM lands.[24] As of 1987, approximately 300 landfills were operating on BLM land, roughly 5 percent of the 6,000 municipal landfills operating in the United States. Inactive landfills present a particular problem for BLM. Many of these sites have been closed for 20 years or more, often with no accurate records on their location. This situation makes it difficult for BLM to locate and assess these landfills accurately for potential contamination of soil and groundwater. BLM's potential liability for cleaning up these landfills depends both on the risks these sites may pose to public health and the environment as well as on BLM's ability to identify the parties responsible for disposing of the hazardous material.

Mining Sites. BLM is responsible for restoring its landholdings that have been contaminated by hazardous wastes from mining operations. BLM reports that actions for the recovery of costs are often futile at mining sites. These sites are often abandoned, or the operator is incapable of financing the cleanup costs. EPA has identified BLM as a primary PRP at the Atlas Asbestos Mine, a large, privately operated asbestos mine partially on land leased from BLM. EPA designated that part of the mine only on BLM land as an NPL site. Thus, BLM is responsible for the entire cleanup if actions for the recovery of the costs from the other PRP's--the mine's operators--are unsuccessful. At this time, the costs of the cleanup actions preferred by the EPA at this mine site range from about $4 million to $12 million.

---

[24] As many as 3,400 landfills may exist on public lands leased by the Bureau of Land Management, most of which are now closed. Sheryl L. Katz, "Hazardous Waste on Public Lands," *Natural Resources and Environment*, vol. 2 (Spring 1986).

In addition, BLM is potentially liable for restoring land that it formerly owned or leased and land that has been affected by mining operations surrounding but not on BLM lands. For example, Smuggler Mountain mining site in Colorado, listed on the NPL, is located on land that was sold to private mine operators by the BLM near the turn of the century. BLM may be responsible as a PRP for the portion of the wastes that were previously disposed there.

Four tracts of BLM land that adjoin the lower Coeur D'Alene river in Idaho provide an extreme example of the problems posed by off-site mining operations. The upstream Bunker Hill mine has operated for over 100 years, discharging most of an estimated 72 million tons of tailings containing lead, zinc, copper, cadmium, and arsenic into the Coeur d'Alene River. EPA has designated an area of 21 square miles centered around the mine as an NPL site. Nevertheless, many square miles of land further downstream were also severely impacted by the mines tailings but were left unlisted on the NPL. Included in these unlisted properties are four small properties owned by the BLM. These sites vary in the level of contamination and their level of use but include at least one medium to high-use recreational site. The Hazard Ranking System score for this site nearly qualifies it for listing on the NPL. BLM could initiate a suit to recover cleanup costs from the mine operators for these unlisted sites. But, considering the liability facing the mine owners for cleanup at the designated NPL site, how much more the owners will be able to contribute for additional cleanup at the other BLM properties is uncertain. Because of the extent of the damage at this NPL site, complete restoration in the near term may be economically unfeasible. BLM may have to limit the use of this area instead.

Other Sites. Other hazardous waste sites on BLM lands have resulted from a wide range of unauthorized uses. The vast expanse and largely unsupervised character of these lands make them vulnerable to companies or individuals looking to dispose of hazardous materials cheaply. A complete survey of all its lands is also difficult for BLM. For example, BLM is increasingly affected by operators of illegal drug laboratories who dispose of the hazardous by-products on BLM lands.

National Park Service

The NPS encompasses over 72 million acres of public lands that include national parks, recreation areas, historic places, parkways, and seashores. Like BLM, the NPS has hazardous waste problems resulting from mining sites and landfills that have operated on NPS land. The NPS has 20 facilities listed on the federal docket with a total of 41 sites that have been identified as needing further investigation or remedial action.

The most significant cleanup program under way at NPS facilities is at the Krejci landfill at the Cuyahoga National Recreation Area in Ohio. A site investigation has been completed, and remedial actions were initiated by EPA. The

NPS is currently undertaking some cleanup projects at this facility.

The NPS recently completed an extensive survey of its properties to identify all potential hazardous waste problems. This survey identified an additional 72 NPS facilities containing 174 sites that required further investigation for contamination. The report ranks 12 of these sites as high priority, 68 sites as medium priority, and 129 sites as low priority (six sites were not ranked). Of these sites, 71 result from onsite storage or disposal of NPS wastes, 73 have problems from authorized disposal of non-NPS wastes in landfills or dumps, 25 have tailings from mining wastes, and 20 have contamination caused by illegal dumping, transportation releases, or shoreline deposition of hazardous materials. Many of these 72 facilities will likely be reported to EPA in early 1990 for listing on future updates of the federal docket.

The NPS is also responsible for handling hazardous waste contamination at the Padre Island National Seashore in Texas. This site has contamination problems resulting from barrels washing ashore that are often unmarked and may contain hazardous substances.

Fish and Wildlife Service

The FWS owns and manages 85 million acres of public lands primarily for protection of animal habitat. Most of the problems at the 26 wildlife refuges listed on the docket stem from agriculture runoff of pesticides and fertilizers or from upstream discharges of water pollutants. Also, the FWS often purchases or inherits land that has been previously used for industrial or defense-related purposes. Of the FWS wildlife refuges on the docket, 14 are formerly owned Department of Defense (DoD) properties.

The FWS is responsible for the one NPL facility owned by DOI, the Crab Orchard National Wildlife Refuge in Illinois. This extensive wildlife refuge was purchased in the 1950s with deed conditions that allowed an industrial park located within its borders to continue operation. The Sangamo Corporation, a defense contractor, operated a manufacturing facility both before and after the refuge was established. The corporation is responsible for the majority of the hazardous waste sites located in the refuge.

A 1987 report from the Government Accounting Office documents results from a 1985 FWS survey that identified contamination on 85 of the 439 FWS wildlife refuges, 41 of which were suspected of hazardous waste contamination by industrial, municipal, and military sources.[25] Some of these sites are listed on the docket; others are being evaluated by FWS and may be added to the docket in future updates.

Bureau of Mines

The BOM is not a major landowning agency but has owned or operated laboratories and manufacturing facilities, underground mines, pilot plants, and demonstration and test sites. The four BOM docket facilities are research laboratories: the BOM laboratory in Brucetown, Pennsylvania, contains more than 200 acres with landfills and other sites that require investigation; another laboratory in Albany, Oregon, has radioactive contamination resulting from BOM efforts to produce zirconium for the Department of Energy.

---

[25] Government Accounting Office, *Wildlife Management, National Refuge Contamination is Difficult to Confirm and Clean Up*, RCED 87-128 (July 1987).

In addition, BOM has been named a PRP at three NPL sites. One of these is the Robinson Brick Company site in Colorado. BOM's liability stems from its efforts to produce radium between 1913 and 1918, whereby a significant quantity of radioactive waste was produced and disposed onsite. BOM has also been named a PRP at Smuggler Mountain Mine in Colorado, where it did extensive testing of the mine tailings to determine the amount of mineral reserves. Finally, BOM has been named a PRP at the Maxey Flats facility in Kentucky, where it disposed of a very small amount of hazardous waste. BOM is one of many parties contributing to the contamination at this site.

Bureau of Reclamation

The BOR manages over four million acres of public lands located around dams and other BOR water projects. BOR has 13 facilities listed on the federal docket. Most of the hazardous waste requirements at these facilities are associated with solvents used at BOR hydropower stations and project offices; however, they should not require cleanup activities. The more significant problems facing BOR stem from agricultural runoff that is contaminating BOR reservoirs and endangering drinking water supplies. Because agriculture runoff is considered a special type of nonhazardous waste under RCRA, remedial actions for these projects--which can be extensive and extremely costly--are completed under requirements of the Clean Water Act and state laws and regulations.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

At the end of fiscal year 1988, DOI had completed preliminary assessments at 211 facilities listed on the docket. Site investigations had been done at 28 of these facilities. Remedial investigations had been initiated at five facilities.[26] DOI has determined that 154 facilities will not require any further action.

Bureau of Land Management

The BLM has submitted a preliminary assessment for 163 of its 199 docket sites; a site investigation has been submitted for 14 of these sites. A remedial investigation/feasibility study (RI/FS) is under way at the Atlas Asbestos Mining Site, the NPL site at which BLM is the primary PRP. BLM expects that no further action will be required at 129 sites.

---

[26] At the end of fiscal year 1988, 243 docket sites were attributed to the Department of the Interior. An additional 20 DOI facilities were added to the November 1988 docket update. Any activities that have been performed at these facilities are not included in this summary.

Fish and Wildlife Service

Preliminary assessments have been submitted for 19 of the 26 FWS docket facilities; site investigations have been completed at 12 of these. FWS concluded that no further action would be required at eight of its facilities. As the former owner of the site, DoD is responsible for the contamination at five of the FWS facilities. DoD is liable for any cleanup actions that may be required. A private party will reimburse the FWS or actually do the cleanup activities at three FWS facilities.

At the Crab Orchard site on the NPL, the FWS, EPA, and the Sangamo Corporation signed a Federal Facilities Initial Compliance Agreement in 1986, which covers actions through the completion of the RI/FS. A Federal Facility Agreement (FFA) is being developed to determine the role of each party in the remedial actions; the FFA will include a specific role for the state in the cleanup process. To date, the private PRP has paid most of the costs associated with this site. FWS expects that final cleanup liabilities will be allocated similarly.

National Park Service

The NPS has completed preliminary assessments at all 20 of its docket facilities, as well as the 72 NPS facilities that were identified in the NPS survey as requiring further investigation. NPS has requested funding in 1991 to initiate or complete site investigations at the 80 sites that the survey rated as a high or medium priority for inspection.

Bureau of Mines

The BOM has completed preliminary assessments at two of its four docket sites and is initiating a site investigation at one of these. Both of these sites will require further action. BOM will not take the lead role in the cleanup of any of the three NPL facilities to which they have been named a PRP at this time. These cleanups will be undertaken by EPA or other PRPs, but BOM may be sued for the recovery of costs.

Bureau of Reclamation

The BOR has submitted preliminary assessments for 10 of its 13 docket facilities. None of these facilities will require further action. BOR is currently cleaning up another site, the Smith Wasteway Site in Washington state, which should be completed during 1990.

U.S. Geological Survey

A preliminary assessment has been submitted for the one docket facility owned by the U.S. Geological Survey. This facility is a water quality laboratory in Colorado. No further action is required.

PROJECTED COSTS AND BUDGETARY IMPACT

The DOI was appropriated $23.9 million in fiscal year 1990 for compliance activities under CERCLA and RCRA. DOI has requested $42.4 million for 1991. DOI has estimated its funding requirements for these activities over the next five years at $302 million, increasing from $42 million in fiscal year 1991 to $77 million in fiscal year 1993, then gradually declining to $59 million by fiscal year 1995. In fiscal year 1989, $16 million was spent for these activities.

More than 80 percent of the total DOI funding for 1990 and 1991 is targeted for compliance activities under CERCLA. Since DOI does not generate significant quantities of hazardous wastes, RCRA expenditures--excluding expenditures for USTs--are fairly small. In DOI's budget request of $42 million for fiscal year 1991, roughly 15 percent is for funding the UST program. The BOR has recently developed a program to comply with UST requirements; other DOI bureaus are planning similar UST programs. In the past, all UST compliance activities have been handled by the individual facilities or regional offices.

The budgets appropriated for RCRA and CERCLA activities do not reflect all hazardous waste activities undertaken by DOI. For instance, hazardous waste investigation and remedial actions are ongoing at several BOM laboratories but are paid for out of the research budgets of the laboratories.[27]

The $10.5 million requested for CERCLA and RCRA activities in 1990 by BOM will reimburse EPA for its cleanup of the Robinson Brick Company. Approximately $3 million has been spent so far to reimburse the EPA for remedial activities at this NPL site. BOM estimates that approximately $11.5 million in cleanup costs will remain after 1990 for total project costs of $25 million. In contrast, total costs for this project in 1987 were estimated at approximately $3 million.

Most of the $4 million appropriated to the NPS in 1990 will be used to reimburse EPA for performing an emergency removal action at the Krejci dump site at the Cuyahoga National Recreation Area. To date, NPS has spent $5.3 million for this cleanup, leaving an estimated $10.1 million for future funding requirements.

MAJOR UNCERTAINTIES

One considerable uncertainty facing DOI concerns EPA's aggressiveness in pursuing actions for the recovery of costs from the DOI bureau that has been named a PRP at NPL sites. If the BLM is asked to bankroll the cleanup of every present or future NPL site on formerly owned or leased BLM land, BLM's liabilities could easily exceed $1 billion. At abandoned mining sites, BLM has a responsibility for cleaning up any hazardous waste sites. At mines where the commercial operators are still present, there is great uncertainty regarding the extent to which these parties--and BLM (or BOM in similar cases)--will be liable for any cleanup actions. Also, few DOI sites are currently on the NPL because of the remote location of most DOI sites. If these locations were to become more populated, these sites would more likely be listed on the NPL in the future.

---

[27] For example, the Brucetown Laboratory docket facility spent approximately $500,000 from its research budget to complete a preliminary assessment and initiate a site investigation in 1988. About the same amount was expected in 1989 to complete the needed investigation. The Bureau of Mines also estimates that $800,000 may be needed in 1990 for remedial actions at the laboratory in Albany, Oregon.

The BLM faces uncertain liabilities resulting from their traditional efforts over past years to assist many large mineral producers with advice, technical support, and, in some cases, actual demonstrations. The BOM has signed many cooperative agreements with mineral companies to provide technical support and demonstrations. At some of these now contaminated mine sites, BOM may be potentially liable for part of the cleanup costs as a result of its active role in the mining operations.

The DOI also faces uncertainty concerning the cleanup standards to which many of its contaminated sites, particularly its mining sites, should be held. For instance, at the Bunker Hill mining site in Idaho, the costs to clean up the site may outweigh the benefits. With current technology and the high costs involved, cleaning up this NPL site may not be feasible. Then again, the health and environmental benefits that will accrue in the long term from a cleanup may outweigh the costs of even the most expensive remedial action.

Typically, DOI and, in particular, BLM have had limited spending on hazardous waste activities, citing other responsibilities and lack of expertise. For example, BLM has resisted a suggestion by the House Subcommittee on Environment, Energy, and Natural Resources to implement an early warning system at landfills to indicate groundwater contamination.[28] The DOI response, prepared to the committee's recommendation (August 15, 1988), estimated that a rudimentary monitoring system would cost a minimum of $50 million in capital costs and $15 million to $30 million annually for sampling and maintenance. DOI further estimated that the costs of a system to meet EPA's standards for monitoring systems would double those costs. BLM has analyzed these costs and judged that as these systems are not legally mandated their costs are "economically and fiscally infeasible."

---

28. Committee on Government Operations, "Landfills on Department of Interior Lands Violate Federal Environmental Standards," November 24, 1987.

DEPARTMENT OF JUSTICE

The Department of Justice (DOJ) has two facilities listed on the November 1988 update of the federal docket--a federal penitentiary in California, managed by the Bureau of Prisons (BOP), and a warehouse for illegal drugs in Oregon, dismantled by the U.S. Marshals Service. The BOP has identified seven other penitentiaries as having sites suspected of hazardous waste contamination. The Drug Enforcement Agency (DEA) also incurs financial liabilities at a large number of illegal drug laboratories. DEA has responsibility for disposing of the hazardous chemicals and contaminated glassware found at these laboratories. The DOJ has been named a Potentially Responsible Party at three privately owned sites on the National Priorities List. DOJ operates at least 100 underground storage tanks (USTs) at the federal penitentiaries.

The DOJ received about $27.5 million for hazardous waste activities in fiscal year 1990 and has requested $26.8 million for fiscal year 1991. The BOP was appropriated $16 million in fiscal year 1990 to investigate and cleanup hazardous waste sites at seven federal prisons. BOP estimates that it will spend about $2.4 million in 1990 to remove hazardous wastes from the federal penitentiaries. The DEA was appropriated $4.3 million in fiscal year 1990 from DOJ's Asset Forfeiture Fund to dismantle drug laboratories and dispose of hazardous chemicals. The U.S. Marshals Service received $4.8 million, also from the Asset Forfeiture Fund, toward its responsibilities for hazardous wastes found at illegal drug laboratories.

For fiscal year 1991, the BOP has requested $16 million to continue its cleanup operations at the seven prisons. BOP estimates that it will spend about $2 million for hazardous waste removal and $1.2 million for compliance with UST requirements. The DEA has requested $7.6 million for hazardous waste-related spending. The U.S. Marshals Service has not requested any funding for fiscal year 1991.

NUMBER AND TYPES OF FACILITIES OR SITES

DOJ incurs hazardous waste liabilities as a result of activities carried out at federal penitentiaries. Liabilities are also incurred as a result of the hazardous waste operations undertaken by the DEA and the U.S Marshals Service at illegal drug laboratories.

Penitentiaries

Some of the 57 federal penitentiaries managed by the BOP have printing, woodworking, metalworking, and other operations that generate hazardous wastes. A recent BOP survey of hazardous waste problems identified 48 sites at 8 penitentiaries that may have hazardous waste contamination. BOP has decided to install monitoring wells and continue investigating 27 of these sites located at 7 prisons.

Drug Laboratories

The DEA confiscated 816 illegal drug laboratories in 1989. The by-products of their operations (most of which produce methamphetamine) include toxins, such as hydrogen chloride gas and lead acetate. Drug dealers rarely dispose of these wastes properly. Currently, the DEA is taking responsibility for hiring contractors to remove and properly dispose of the toxic chemicals and contaminated glassware contained in these laboratories. The DEA does not investigate or clean up any contamination that may remain in the enclosed facility, the soil, or groundwater.

The U. S. Marshals Service becomes the custodian of illegal drug laboratories that the DEA seizes. The U.S. Marshals Service is responsible for cleaning up any of these properties before reselling them. Because of the potential costs facing the agency as a result of these hazardous waste liabilities, DOJ has implemented a policy that DEA will not take title to illegal drug laboratories when it confiscates them. Thus, the U.S. Marshals Service is not required to perform any cleanup operations once the DEA has removed the contaminated glassware and hazardous chemicals left at the site.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

DOJ expects that no further action will be required at the two docket facilities. By the end of fiscal year 1990, BOP expects to complete or to contract for the installation of monitoring wells at the 27 sites at the 7 BOP prisons that require investigation. BOP expects to complete remedial activities over the next several years.

BOP has initiated a bureauwide program to comply with the UST program requirements. Replacement or repair of leaking USTs was ongoing at several facilities where either tanks were known to be a problem or where construction made tank replacement logical.

DEA's efforts to dismantle drug laboratories are ongoing. Officials were not aware of any sites confiscated where significant remedial action would be required.

PROJECTED COSTS AND BUDGETARY IMPACT

The Congress appropriated $16 million to BOP in fiscal year 1990 to continue installing monitoring wells and possibly to initiate remedial actions at the seven federal penitentiaries. In fiscal year 1989, $7.2 million was appropriated, which was one-half of BOP's initial request of $14.4 million. BOP officials expect that it will cost about $2.4 million in fiscal year 1990 to remove hazardous wastes from federal prisons and about $2 million in fiscal year 1991. Furthermore, BOP expects that its UST program will require about $1.2 billion, which it will request for fiscal year 1991.

The DEA received $4.3 million for fiscal year 1990 to dismantle drug laboratories and to ensure the safe disposal of their contents. This figure may rise significantly if the upward trend continues in the number of drug laboratories confiscated by DEA. DEA has requested $7.6 million for these activities in fiscal year 1991. The U.S. Marshals Service received $4.8 million in fiscal year 1990 for hazardous waste activities at illegal drug laboratories seized by the DEA. The U.S. Marshals Service has requested no funding for fiscal year 1991.

MAJOR UNCERTAINTIES

DEA exposes itself to several sources of potential liability through the confiscation of illegal drug laboratories. In some cases, DEA confiscates land as part of the seized asset program. This program is designed to fund drug enforcement efforts by seizing the assets criminals acquire through the sale of drugs. Section 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) makes federal agencies liable for ensuring that any property they dispose is free of all hazards to human health and the environment. This section also states that the federal agencies are liable forever for all hazards that are on the property at the time of sale. Thus, the DOJ is liable for complete cleanup and remediation of any sites that it confiscates. As a result, the DOJ has instructed DEA officials to forego the right to seize assets out of deference to the potential liabilities it may incur. This deference results in a cost as DEA may forgo seizure of many otherwise valuable properties because of fear of the far-reaching impact of CERCLA's deed restrictions.

Also, DOJ may eventually be asked or required to contribute to the cleanup of environmental dangers even at sites they decide not to confiscate. Currently, no one is taking responsibility for cleaning up the contamination at these sites. The owners of these sites are often either incarcerated or unable to finance the needed cleanup. A logical funding source that is often mentioned is the Asset Forfeiture Fund--the same that is being used to fund the current disposal of hazardous materials at the confiscated laboratories. This fund is being deprived of assets, however, because of the potential liabilities. DOJ has resisted suggestions to divert more funds from its law enforcement efforts to clean up environmental problems to which they did not contribute. Lacking a better funding alternative, however, policymakers may be inclined to mandate that DOJ use this fund to pay for more extensive cleanups at such sites.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The National Aeronautics and Space Administration (NASA) has 12 facilities listed on the November 1988 update of the federal docket. NASA is also named a Potentially Responsible Party at six nonfederal sites listed on the National Priorities List (NPL).[29] In addition, NASA has approximately 300 underground storage tanks (USTs) that must be checked in compliance with the UST program requirements.

NASA's budget appropriations for fiscal year 1990 includes $30 million for various environmental compliance and restoration projects. NASA estimates that at least $30 million to $35 million will be required annually for continuing cleanup projects and environmental activities.

NUMBER AND TYPES OF FACILITIES OR SITES

The NASA docket facilities include field installations, research laboratories, or government-owned industrial plants that support NASA activities. These facilities share many problems typical of laboratories and industrial sites but include some problems that reflect the unique nature of NASA's mission. Five of the docket facilities were formerly owned by the Department of Defense (DoD); some environmental contamination problems date from this DoD use.

NASA may be required to treat groundwater that was contaminated at the time of U.S. Army rocket testing at the Jet Propulsion Lab (JPL) in Pasadena, California. This site scored high enough under the Environmental Protection Agency's (EPA's) Hazard Ranking System (HRS) for potential inclusion on the NPL. Follow-up studies are under way at the request of EPA to confirm whether or not JPL is the source of the groundwater contamination and whether the site will be listed on the NPL. Other NASA facilities have problems with contaminated groundwater but have lower HRS scores because there is no evidence of contamination to drinking water supplies.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

NASA has completed a preliminary assessment at all 12 docket facilities and has completed a site inspection at 9 of these facilities. At two other docket facilities, a facility investigation is being conducted under the Resource Conservation and Recovery Act of 1976 (RCRA), similar to a site investigation under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) but covering an entire installation. The preliminary assessment at 1 of the 12 facilities indicated that no further action would be required.

---

[29] Fourteen docket facilities were attributed to the National Aeronautics and Space Administration in the November 16, 1988, update; one of these is not a federal facility, and one facility was reported twice.

Based on these investigations, NASA believes that 10 of these 12 facilities will require remedial action for hazardous wastes under CERCLA or RCRA. A NASA program official stated that remedial action will begin at each site as soon as investigations are complete and appropriate state or federal EPA officials approve the cleanup plans. Some work is currently under way and major cleanup funds are expected to be needed beginning in fiscal year 1993.

NASA also has about 300 USTs. NASA has established a centrally managed program to check the USTs. Each NASA field installation will do the actual work on its own USTs. NASA centers began this effort in 1989 with tank replacement expected to continue through 1995.

PROJECTED COSTS AND BUDGETARY IMPACTS

For fiscal year 1990, NASA was appropriated its full request of $30 million for environmental compliance and restoration activities. In fiscal year 1989, NASA requested and was appropriated $26 million for this program, compared with $23.9 million in 1988. Spending for investigation and removal of existing contamination at NASA sites has increased from $4.8 million in fiscal year 1988 to $11.8 million in fiscal year 1990.

NASA's environmental compliance and restoration program encompasses a wide range of activities, including removal of asbestos and polychlorinated biphenyls (PCB) transformers. The budget request for fiscal year 1990 will be distributed as follows: $11.8 million for investigation and remedial action at hazardous waste sites; $6.5 million for construction, modification, or upgrading of waste storage or treatment systems; $5.8 million for removal and replacement of PCB transformers and asbestos; $0.9 million for replacement of USTs; and $5.0 million for studies, assessment, design, and a variety of projects costing under $150,000 each.

The initial budgets requested from NASA installations totalled $54 million for environmental compliance and restoration for fiscal year 1990. A NASA environmental program official explained that the proposed $30 million budget was requested to address the most pressing environmental needs and to comply with all environmental laws and regulations. Federal budget constraints dictate a phased-in approach with the most urgent needs being addressed first. Program costs may rise somewhat above the $32 million requested for fiscal year 1991, but costs are currently expected to remain in the $30 million to $35 million range over the next few years. Once remedial activities are initiated at the 10 NASA installations still in the investigation stage--probably during the mid-1990s--NASA's environmental budget needs will probably increase.

NASA is spending some additional funds out of the operation and maintenance budgets of its installations. These expenditures are for environmental requirements related to facility operations, such as permit monitoring and air scrubber systems, and for noncapital expenses related to hazardous waste remediation, such as groundwater treatment and monitoring wells. These latter expenditures will also probably increase as NASA progresses with remediation activities at its facilities.

POSTAL SERVICE

The Postal Service (PS) has five facilities listed on the federal docket and has been named a Potentially Responsible Party at seven privately owned sites on the National Priorities List. The PS expects to incur most of its liabilities for hazardous wastes at the approximately 5,500 underground storage tanks (USTs) it owns or operates. Four of the PS docket sites are believed to be small quantity generators of hazardous wastes and thus should be delisted. The remaining PS site is located at the Department of the Army's Rocky Mountain Arsenal in Colorado. The preliminary assessment submitted for this site indicated that no further action would be required. The PS anticipates that no funds will be required for further investigation or remedial action at its docket sites. At this time, the PS has not identified any other sites that have potential hazardous waste contamination.

The bulk of PS environmental liabilities stem from a 10-year program recently initiated to repair or replace its USTs. Since the PS is legally required to recover all its costs through the sale of postage stamps, its spending does not directly affect the federal budget. The PS budgeted $39.1 million in fiscal year 1989 to begin the UST compliance program. About this same level of funding will be required in fiscal year 1990 and annually throughout the 10-year program.

SMALL BUSINESS ADMINISTRATION

The one site listed on the federal docket for the Small Business Administration (SBA) is the Cal West Metals Site in New Mexico. This site is also on the National Priorities List (NPL). Former owners of the site are responsible for causing the hazardous waste contamination; however, SBA acquired the site through foreclosure actions on an SBA loan. It is unclear whether the agency will be held financially responsible for any part of the facility cleanup. SBA has also been named a Potentially Responsible Party at two privately owned NPL sites. At this time, SBA does not know the extent of its current or potential liabilities for hazardous waste investigation or cleanup.

NUMBER AND TYPES OF FACILITIES OR SITES

The SBA primarily operates as a financial institution providing direct and guaranteed loans to small and disadvantaged business. SBA does not generate or dispose of any hazardous materials nor control the operation of underground storage tanks. SBA acquires ownership of properties that have been posted as collateral for defaulted loans. These properties may have residual hazardous waste problems that become SBA's responsibility through foreclosure actions.

SBA has conducted a survey of its regions in an effort to determine the potential costs and expected liabilities for hazardous waste problems on its properties. The results are inconclusive, however, because of numerous uncertainties as to which properties are contaminated and to what extent SBA will be financially responsible for their cleanup. SBA has provided loans to many businesses that generate or store hazardous materials on property that SBA may acquire through future foreclosures. Consequently, SBA is likely to incur additional hazardous waste cleanup liabilities in the future.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

SBA is investigating the extent of hazardous waste contamination at its properties. Some remedial actions have been taken. Contamination at the Cal West Metals Site, listed on the NPL, resulted from various industrial operations, including recycling car batteries. The former owners have signed an agreement with the Environmental Protection Agency (EPA) specifying certain cleanup requirements. The former owners are in the process of a fairly extensive removal action that may mitigate the eventual remedial actions that will be required at this site. Testing so far indicates that the lead contamination has not migrated into the aquifer beneath this facility.

PROJECTED COSTS AND BUDGETARY IMPACT

SBA was unable to estimate expected liabilities for hazardous waste problems at its acquired properties because of the high degree of uncertainty regarding financial responsibility at sites acquired through foreclosure. At the Cal West Metals Site, the former owners have been financially responsible for all cleanup costs so far. EPA has not yet indicated to SBA what, if any, its liabilities may be at this site.

MAJOR UNCERTAINTIES

Whether EPA will actively pursue the SBA to recover costs for the Cal West Metal Site and other properties may depend on many factors. These factors include the financial condition of the previous owners, the extent of the cleanup required, and the legal interpretation of the Superfund Amendments and Reauthorization Act (SARA) regarding liability. The liability of the SBA for the contamination on its properties acquired through foreclosure actions is the major uncertainty.

Because of the potential liability facing SBA and other similar lending agencies, the SBA is foregoing acquisition of many sites with known or suspected hazardous waste contamination. The SBA thus forfeits properties that would provide potential revenues through property resale. As an example, an SBA regional administrator estimated that the collateral value for properties that his SBA region would refuse to foreclose on would exceed $42 million over the next five years.

Like the Economic Development Administration in the Department of Commerce, SBA also may face potential liability at properties where it is solely a lender, without acquiring ownership. Under SARA, EPA may be able to initiate actions against a lender to recover costs for cleanup at NPL sites if the loans provided allowed a business to continue the operations that resulted in the contamination. EPA's efforts to recover costs will depend primarily on the lender's actual involvement in the operation of the business. SBA may be more vulnerable to these potential liabilities than private credit institutions, given the dual role it often plays as both lender and advisor to small businesses.

TENNESSEE VALLEY AUTHORITY

The Tennessee Valley Authority (TVA) has 17 facilities listed on the November 1988 update of the federal docket and at least 250 underground storage tanks (USTs) that will require checking under the UST program requirements. For fiscal year 1990, TVA was appropriated about $2 million primarily for environmental activities at the one TVA facility that relies on appropriated funds, the National Fertilizer Development Center (NFDC) in Muscle Shoals, Alabama. TVA has estimated that it will require another $40 million from 1991 to 1995 for environmental projects at the NFDC. Funding for the cleanup of other TVA facilities and most USTs comes from the rates charged users of TVA-generated electricity.

NUMBERS AND TYPES OF FACILITIES OR SITES

TVA is a government-owned corporation that operates a large number of power generating plants as well as the nation's largest fertilizer development laboratory. None of TVA's 17 docket facilities are likely candidates for the National Priorities List. Fourteen of these facilities are nuclear, steam, or hydroelectric generating plants. Two facilities, a power storage area and a uranium processing mill, have been used or purchased to support these utilities. The final facility on the docket is the NFDC research complex.

The problems at the 17 TVA facilities are typical of the problems found at utility plants. The Environmental Protection Agency (EPA) has recommended that utility waste not be regulated because, like mining wastes, the large quantities of these wastes have low toxicity. Other wastes, such as polychlorinated biphenyls (PCBs), solvents, and paint thinners, have sometimes been mixed with the utility waste piles or disposed of separately onsite.

The power storage area in Muscle Shoals, Alabama, is TVA's central receiving center for storing hazardous wastes and PCB's from other TVA sites prior to off-site treatment and disposal. Two major storage areas are on this site, as well as numerous other areas where solid or hazardous wastes are handled.

The uranium mill located in South Dakota was purchased to ensure TVA a supply of processed uranium to operate its nuclear power plants. TVA never used this mill, as the demand for nuclear power decreased and a cheap steady source of uranium was available elsewhere. TVA has already spent over $20 million to decontaminate and decommission this mill under the requirements of the Atomic Energy Act. In the process, TVA found an oil spill and reported it under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103(c). EPA completed a preliminary assessment at this facility and has determined that no further action would be required.

The NFDC has been responsible for development of the majority of the fertilizer currently used throughout the world. The facility covers more than 2,600 acres with 190 specific sites where solid wastes are managed. One area of this facility was rented by the Department of the Army in the 1950s for the Phosphate Development Works. TVA and the Army shared use of a large landfill on this property where hazardous substances were disposed.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

Preliminary assessments have been completed at 16 of the 17 TVA facilities on the docket. (An assessment for one power plant in Alabama that was added to the November 1988 docket update has not yet been submitted.) Based on the 16 completed assessments, TVA expects that only 3 facilities--the NFDC, the power storage area, and 1 utility--will require further remedial action under CERCLA.

A Facility Investigation for the NFDC was submitted to EPA to obtain a part B permit under the Resource Conservation and Recovery Act of 1976 (RCRA). The investigation determined that 50 out of the 190 individual solid waste management areas would require further investigation or remedial action under RCRA. The Muscle Shoals power storage area is also in the process of applying for a RCRA part B permit. TVA believes that it has already satisfactorily cleaned up the two major storage areas at this facility. The facility has approximately 20 other solid waste management sites that may have to be investigated under RCRA requirements for corrective actions. The one utility where cleanup is required has a site that was used for fire training where soil was contaminated with petroleum and solvents.

PROJECTED COSTS AND BUDGETARY IMPACT

TVA submitted its first specific request of funds for environmental compliance in the budget for fiscal year 1990. Of the $2 million budget appropriated, $1.1 million is for environmental investigations at the 50 potentially contaminated solid waste management sites at the NFDC, $0.6 million is for asbestos removal at the NFDC, and the remaining $0.3 million is for the demolition of buildings. This funding level was reduced from TVA's original request of $6 million for environmental activities during budget negotiations with the Office of Management and Budget.

TVA has estimated that it will need about $40 million between 1991 and 1995 primarily for environmental activities at the NFDC. The bulk of these funds will be spent between 1993 and 1995 to undertake the major remedial cleanup projects required at the NFDC.

Funding for environmental compliance at all other TVA sites comes out of the general expense budgets of the utilities, funded through charges for generating electricity. These costs should not require federal expenditures, unless federal subsidies are provided to cover TVA's expenses.

DEPARTMENT OF TRANSPORTATION

The Department of Transportation (DOT) has 48 facilities listed on the federal docket, one of which has been proposed for the National Priorities List (NPL). DOT has been named a Potentially Responsible Party (PRP) at 10 privately owned NPL facilities. DOT is a former owner of another site that is currently proposed for the NPL. Also, the DOT has identified 53 hazardous waste sites in Alaska, owned or formerly owned by one of its agencies, the Federal Aviation Administration (FAA). These sites will probably require cleanup activities. In addition, the DOT owns at least 4,020 underground storage tanks (USTs).

Two DOT agencies, the FAA and the Coast Guard (CG), have requested funding for UST repair or replacement and for assessment of hazardous waste sites. For fiscal year 1990, the FAA received $12.6 million for these activities, and the CG received approximately $6 million. Together, these two agencies have requested about $36 million for hazardous waste activities for fiscal year 1991. The FAA has estimated future requirements for hazardous waste funding of about $260 million beyond 1990. Other DOT agencies, the Federal Highway Administration (FHA) and the Federal Railroad Administration (FRA), may also face liabilities for hazardous waste activities at facilities they currently or previously owned.

NUMBER AND TYPES OF FACILITIES OR SITES

DOT is responsible for the smooth operation of the nation's highways, seaways, and airports. The majority of functions performed by the DOT are regulatory in nature, but the FAA and the CG have significant operations and landownership with potential hazardous waste contamination.

Federal Aviation Administration

The FAA regulates air transportation and manages the air traffic control system. The FAA has one docket facility that is proposed for the NPL, the FAA Technical Center in New Jersey. The FAA has identified 22 sites at this facility with potential soil and/or groundwater contamination. Four of the other six FAA docket facilities are Alaskan airstrips. The two remaining sites are located in Oklahoma, both of which are expected to require cleanup of the soil and groundwater. In addition to these docket facilities, the FAA suspects some contamination at perhaps 53 Alaskan airfields. This contamination may have resulted from hazardous solvents and waste oils, which are by-products of normal facility and equipment maintenance operations, or from dumps and storage operations by municipalities or residents, which the FAA has allowed on these lands. The FAA estimates that approximately 3,150 USTs will have to be replaced in compliance with federal and state UST requirements.

Coast Guard

The CG owns and operates a variety of facilities, vessels, and aircraft. The 39 CG facilities on the docket consist of bases located around the nation's major seaports and regional support centers. These facilities may contain central storage areas for fuel (fuel farms) or operation and maintenance facilities. The most significant problems are located at eight CG support centers. At the support center in North Carolina, the CG is investigating possible groundwater contamination from a waste treatment lagoon, a fire training pit, and a fuel farm. At another center in Kodiak, Alaska, the CG has identified six sites where solvents and waste oils were disposed or leaked into the ground. The CG is also responsible for 870 USTs.

Federal Railroad Administration

The FRA is a former owner of a facility that has been proposed for the NPL, the Standard Steel and Metal Salvage Yard in Alaska. This site was leased from the FRA and has since been sold to the Alaska Railroad. The previous commercial owners of this operation have declared bankruptcy. As a former owner, the DOT is a PRP and may be liable for part of the remaining cleanup costs.

Other Agency Liabilities

Two other docket facilities are owned by the DOT, a Transportation Test Center and an FHA facility, both located in Colorado. At the former facility, the DOT is investigating 11 hazardous waste sites with potential cleanup requirements; at the latter site, the DOT is responsible for removing and cleaning up a UST filled with hazardous wastes.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

The DOT has completed preliminary assessments for 34 of the 48 docket facilities; the assessments for the other 14 sites are planned or under way. (Completed assessments at two FAA facilities are being updated.) Based on the completed assessments, 24 facilities are expected to require no further action, while remedial activities are expected for at least 12 sites. Currently, some remedial actions are under way at two CG bases and one FAA airport in Alaska.

Federal Aviation Administration

The FAA has completed the preliminary assessments at two of its seven docket facilities and is updating two others. A remedial investigation is under way at an FAA airport in Alaska and at the New Jersey Technical Center; some remedial actions are under way at the Alaskan airport.

Coast Guard

The CG has submitted preliminary assessments at 32 of its 39 docket facilities; site investigations have either been completed or are under way at 8 of these facilities. Based on the investigations completed so far, the CG has indicated that no further action will be required at 24 of its facilities, although apparently the Environmental Protection Agency (EPA) has not fully agreed with these evaluations. Remedial actions are under way at CG bases in Michigan and Texas. The CG will perform remedial actions at three sites located at the North Carolina Support Center and will conduct a remedial investigation/feasibility study at the six identified hazardous waste sites at the Support Center in Kodiak, Alaska. In 1989, 80 sampling wells will be installed, and a feasibility study based on these results should be initiated in 1990.

Other Facilities

At the two other DOT docket facilities located in Colorado, preliminary assessments are expected to be completed in May 1990. At both of these facilities, remedial actions are likely to be required.

PROJECTED COSTS AND BUDGETARY IMPACT

For fiscal year 1990, the DOT has budgeted about $19 million for investigations and cleanup activities at hazardous waste sites, including at least $6 million for UST repairs. The FAA has projected another $92 million in future remedial actions for hazardous wastes at 55 of its facilities and about $166 million in additional funding requirements for completion of UST repairs or replacements beyond fiscal year 1990.

Federal Aviation Administration

The FAA requested $17.7 million for hazardous waste activities for fiscal year 1990: $7 million to investigate and clean up hazardous waste sites, and $10.7 million for its UST program requirements. The Congress appropriated only $12.6 million. For fiscal year 1991, the FAA has requested a budget of $25 million for its hazardous waste activities. Expenditures for environmental activities in previous fiscal years were funded from other budget categories.

Currently, the FAA projects that future investigation and cleanup will cost $92 million. This spending would be distributed as follows: $25 million for the New Jersey Technical Center (proposed by the EPA for listing on the NPL), $10 million for the Aeronautical Center in Oklahoma, and $57 million for 53 Alaskan airstrip sites. Because FAA is in the initial stages of identifying the extent of its hazardous waste problems, additional funds may be needed at these sites; contamination may also be discovered at other sites.

In addition to the $5.9 million that was appropriated in fiscal year 1990 for replacement of USTs, $25 million was appropriated for the UST program in 1989, and a total of $8.9 million was appropriated for fiscal years 1982 to 1988. The FAA projects that total expenditures for replacing its 3,150 USTs will be $206 million, with $166 million remaining after fiscal year 1990.

Coast Guard

The Coast Guard received $6 million in fiscal year 1990 for its environmental compliance program. For fiscal year 1991, the CG has requested $7 million distributed for its Environmental Compliance and Restoration Account, for upgrading and replacing its USTs, and for remediation efforts at hazardous waste disposal sites. In addition, the CG has requested $4 million in operating expenses for fiscal year 1991 to maintain environmental compliance at CG facilities.

MAJOR UNCERTAINTIES

The major uncertainty facing DOT concerns the 53 FAA sites for which DOT is responsible in Alaska. Most of these sites will require remedial actions. The extent of the contamination at these sites and the potential costs are uncertain because site investigations have not yet been done. The remote locations and inclement weather associated with these sites will make any remedial actions costly and difficult.

DEPARTMENT OF THE TREASURY

The Department of the Treasury has two facilities listed on the November 1988 update of the federal docket.[30] The number of underground storage tanks (USTs) operated by the Treasury is small. The Treasury has not earmarked any funds for the investigation of hazardous waste sites or for the repair or removal of USTs.

The Treasury docket facilities are a Customs Service post in Washington state and a Bureau of Engraving and Printing (BEP) facility in Washington, D.C. The Customs Service facility was listed because the Treasury applied for a one-time permit for temporary storage of industrial chemicals that were seized. The Treasury has requested that this site be delisted. The BEP facility generates a significant quantity of wastes, although no spills or releases are known to have occurred. A preliminary assessment was submitted for this facility that indicated no further action was necessary. The Treasury is not aware of any hazardous waste sites that will require any further investigation or remedial action.

---

[30] A third docket facility was listed in the November 1988 update, but it was incorrectly attributed to the Customs Service within the Treasury.

VETERANS ADMINISTRATION

The Department of Veterans Affairs (VA) has 11 facilities listed on the November 1988 update of the federal docket and estimates that it owns about 500 underground storage tanks (USTs).[31] The VA has been named as a Potentially Responsible Party (PRP) as a minor contributor at seven sites listed on the National Priorities List (NPL).

The VA was appropriated $12 million in fiscal year 1990 for hazardous waste activities. This includes funding for cleanup actions at those NPL sites where VA has been identified as a contributor, for any necessary investigations of docket facilities, and for hazardous waste abatement projects. The VA has requested only $2 million for hazardous waste activities for fiscal year 1991, primarily because funds are expected to carry over from the 1990 budget.

NUMBER AND TYPES OF FACILITIES OR SITES

The 172 medical centers that make up the VA medical system are responsible for most of the hazardous waste and medical waste produced, stored, and disposed by the VA. These medical centers include the VA docket facilities. Most of their hazardous wastes are disposed off-site at approved hazardous waste disposal facilities.

A number of VA medical centers have removed polychlorinated biphenyls (PCBs) transformers. In the past, some of these transformers were disposed by third parties in what is now considered an improper manner. This improper disposal accounts for much of the VA's liability at NPL sites. PCBs currently removed from VA facilities are incinerated at approved facilities. Additionally, the VA has acquired land contaminated by the activities of former owners, including the Department of Defense.

STATUS OF INVESTIGATION AND CLEANUP EFFORTS

The VA has completed a preliminary assessment for 10 of the 11 docket facilities. The Environmental Protection Agency has not yet indicated whether additional investigation or cleanup is necessary at these facilities. The VA expects that no further action will be required at seven of these facilities. A VA Medical Center in New Orleans is undergoing remedial actions to remove contaminated soil.

The VA has established a percentage of cleanup costs for which it is liable at two of the seven NPL sites where it has been named a PRP. These sites are preceeding with technical studies and cleanup. The VA anticipates that its liability at other sites where it is a PRP will be limited to that of a minor contributor.

---

[31] The November 1988 docket update actually listed 12 facilities to the Veterans Administration, but one facility was listed twice.

PROJECTED COSTS AND BUDGETARY IMPACT

The VA was appropriated $12 million in fiscal year 1990 for hazardous waste activities at the docket facilities where further action may be necessary. These appropriations were also used to finance VA cleanup liabilities at private NPL sites. In fiscal year 1989, $5 million was appropriated. The VA funds any investigation and repair or replacement of its USTs from the operation and maintenance budgets of the individual facilities.

Removing contaminated soil in conjunction with construction at the VA Medical Center in New Orleans may cost as much as $9.6 million of the $12 million budget appropriations in 1990. The remaining $2.4 million was requested for cleanup costs at NPL sites where the VA is a PRP, for further investigations required at docket facilities, and for other hazardous waste requirements.

MAJOR UNCERTAINTIES

A significant uncertainty facing the VA is its potential liability at NPL sites where it has been named a PRP. Another uncertainty deals with the inability to predict the number of NPL sites at which the VA may be named a PRP in the future and the liability associated with these sites.